Section 3 Zone 4 East Kapālama (Test Excavations 054 to 085)

3.1 Overall Location

For reporting purposes for this archaeological inventory survey, the City Center Section 4 of the HHCTCP has been divided into 11 zones based on geographical and cultural boundaries. The East Kapālama Geographic Zone runs along Dillingham Boulevard from Waiakamilo Road at the west end to just east of Akepo Lane at the east end (Figure 11). The eastern boundary also represents the approximate northwestern corner of the historic Kūwili Fishpond/historic shoreline (see Vol. II Figure 8, Vol. II Figure 12, and Vol. II Figure 26). The western third of the East Kapālama Zone corridor was located within Kapālama *Ahupua'a*, while the eastern two-thirds of the corridor are located within Honolulu *Ahupua'a*. The *ahupua'a* boundary was on the east side of the Kapālama Canal.

The East Kapālama Zone includes 32 AIS test excavations numbered T-054 through T-085 (Note: T-055 was abandoned due to utility conflicts; however, a grease trap was being excavated in the immediate vicinity on private property. Information was recorded from the grease trap excavation to supplement the abandoned T-055.) The test excavations were numbered from northwest to southeast. The test excavations were located within multiple TMKs [1] 1-5-006, -015, -017, -020, -022 and [1] 1-5-007 were along Dillingham Boulevard (owned by the City and County of Honolulu); the *makai* portion of Kapālama Station was located in [1] 1-5-015:008 (owned by DTC Investments, LLC); the *makai* portion of Kapālama Station was located in [1] 1-5-020:003 (owned by Kamehameha Schools); and the *mauka* portion of Kapālama Station was located in [1] 1-5-017:006 (owned by the University of Hawai'i).

3.2 Transit Infrastructure

Transit infrastructure for the current project within the East Kapālama Zone consists of the Kapālama Station (to be constructed east of Kapālama Canal and Kokea Street on both sides of Dillingham Boulevard), a support facility structure located *mauka* of the station, 24 single columns, half of a straddle-bent column to support the fixed guideway system spaced along Dillingham Boulevard, and utility relocation corridors throughout. Test excavations focused on utility relocation corridors (T-054, T-056 through T-059, T-070, T-072 through T-081, and T-083) and the footprint of Kapālama Station (T-060 through T-069 and T-071), and also included excavations for column locations (T-082, T-084, and T-085).

3.3 Geography, Geology, and Land Forms

The East Kapālama Zone was situated along the low-lying coastal flats immediately inland of Kapālama Basin, approximately 1 km from the shoreline. Elevations within the East Kapālama Zone range from approximately 1.3 to 2.1 m amsl, with either end near the 2.1 m mark and the internal area at the lower end of the range. Although level for the majority of the length of the East Kapālama Zone, the modern land surface is slightly below the exposed Pleistocene limestone shelf on either end of the zone.

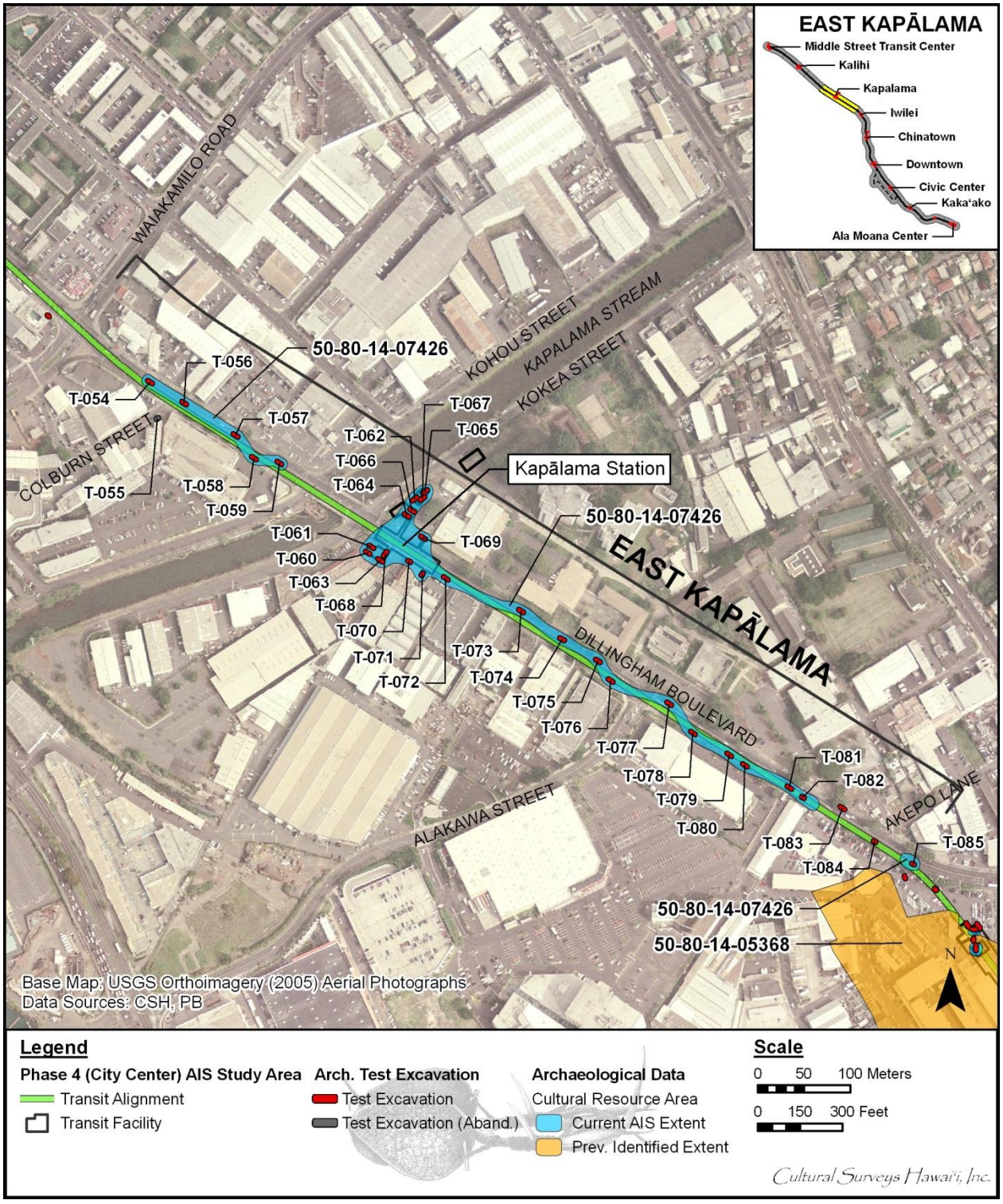


Figure 11. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005) showing the location of the East Kapālama Zone AIS test excavations (T-054 through T-085) along the HHCTCP corridor and at the Kapālama Station

Intensive land reclamation activities in the early to mid-twentieth century raised the land surface to be more level with the exposed limestone shelf. As the East Kapālama Zone traverses a predominantly urban landscape, vegetation in the immediate vicinity was largely the result of landscaping and consists primarily of introduced (non-indigenous) landscaping trees, shrubs, and ground cover. Of particular note are the numerous *kamani* trees that line much of Dillingham Boulevard. Kapālama Canal (known as Niuhelewai Stream in traditional times) transverses the East Kapālama Zone along the Kapālama/Honolulu *Ahupua'a* boundary. The average annual rainfall in the East Kapālama Zone was approximately 760 to 810 mm (30 to 32 inches) (Giambelluca et al. 2011).

According to the U.S. Department of Agriculture Soil Survey Geographic (SSURGO) Database (2001) and soil survey data gathered by Foote et al. (1972), soils within the East Kapālama Zone consist predominantly of Fill land (FL), with a small area of Ewa silty clay loam (EmA) southwest of T-081 (Figure 12). Fill land soils are described as follows:

> …areas filled with material dredged from the ocean or hauled from nearby areas, garbage, and general material from other sources…. This land type was used for urban development including airports, housing areas, and industrial facilities. [Foote et al. 1972:31]

Ewa silty clay loam soils are described as follows:

> …well-drained soils in basins and on alluvial fans…[that] developed in alluvium derived from basic igneous rock... These soils are used for sugarcane, truck crops, and pasture. The natural vegetation consists of fingergrass, kiawe, koa haole, klu, and uhaloa. [Foote et al. 1972:29]

3.4 Traditional and Historic Land Use

As noted above, the East Kapālama Zone was situated within both Kapālama and Honolulu Ahupua'a. Brief summaries of traditional and historic land use of both *ahupua'a* in the vicinity of the East Kapālama Zone follow.

3.4.1 Traditional Accounts of the East Kapālama Zone

The place name Kapālama was often understood to refer to an enclosure (*pā*) of *lama* wood that surrounded the place of residence of high ranking *ali'i* (chiefs) (Pukui et al. 1974:87). McAllister (1933:88) relates the following: "Kapālama was said to have obtained its name from an establishment in which the young ali'i were kept just before pairing off for offspring." Westervelt (1923:165) attributes the O'ahu place name to a chiefess of O'ahu (Kapālama) who lived in that area.

Honolulu was traditionally known as Kou and had a long tradition as a royal center where the *ali'i* would meet and entertain. It was "noted for *kōnane* (pebble game, like checkers) and for *ulu maika* (bowling), and was said to be named for the executive officer (*ilāmuku*) of Chief Kākuhihewa of O'ahu" (Pukui et al. 1974). In accounts of the Pele and Hi'iaka saga (Emerson 1915:168; Nogelmeier 2006:402-420), Hi'iaka from Hawai'i Island and Lohi'au, chief of Kaua'i, joined with Pele'ula, chiefess of O'ahu, for pleasure at Kou.

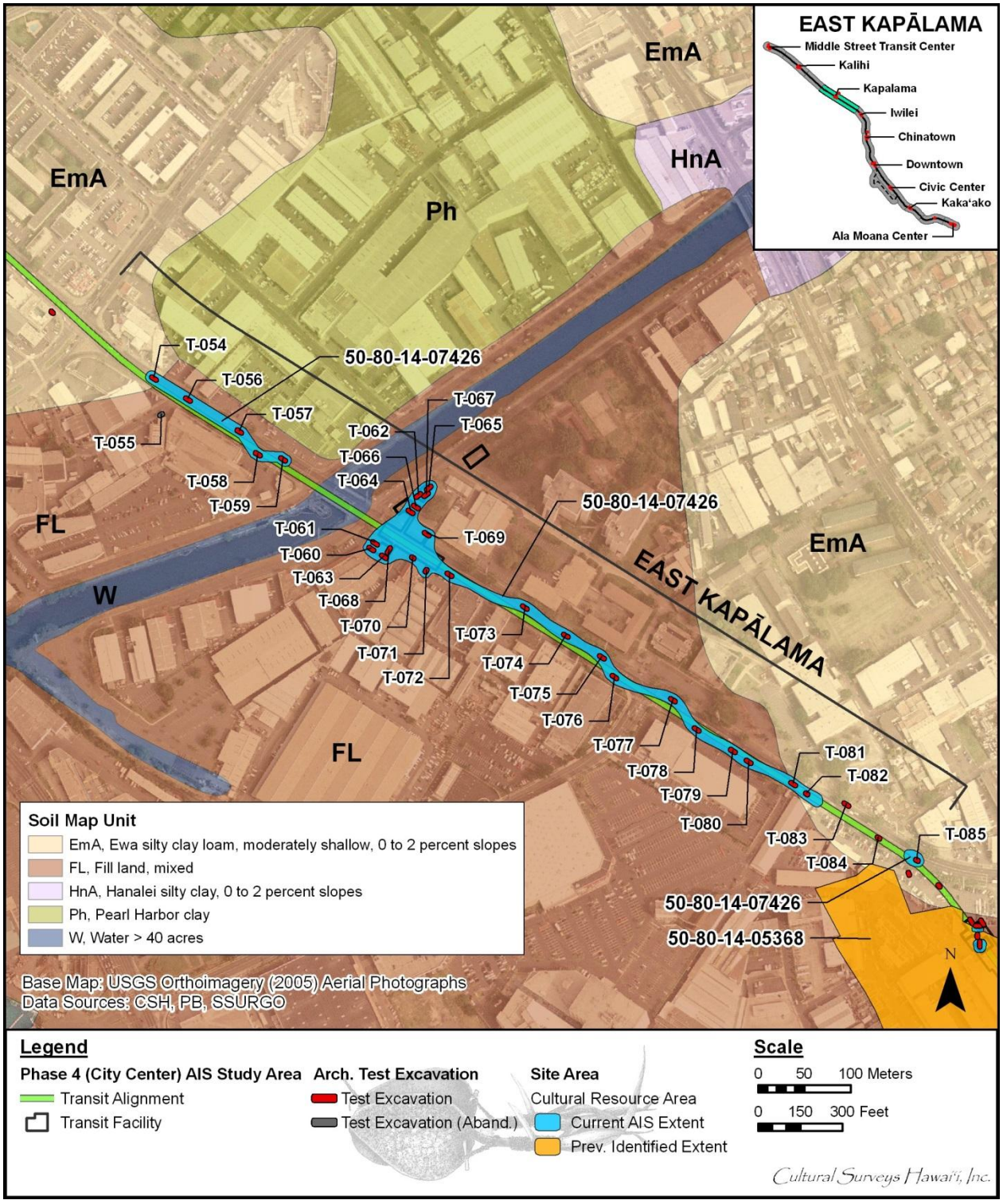


Figure 12. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005) with overlay of the Soil Survey of Hawai'i (Foote et al. 1972) showing sediment types within and in the vicinity of the East Kapālama Zone

Two fishponds were located in the vicinity of the East Kapālama Zone, within Honolulu *Ahupua'a*, until approximately 1900. Kūwili Fishpond was located to the south and east of the East Kapālama Zone and was used to designate the border between the East Kapālama Zone and the Iwilei Zone in the current zone designation system. This pond was mentioned in the legend of Kū'ula (the fish god of Hawai'i), where Kū'ula's son, 'Ai'ai, gave a sacred fishhook to his son, Puniaiki, who used it to summon a substantial school of *aku* to Honolulu Harbor. Kawa Fishpond was located south of Kūwili Fishpond. These ponds were an important resource for the inhabitants of the area.

Another water source, Niuhelewai Stream (now known as Kapālama Canal), transverses the East Kapālama Zone in Kapālama *Ahupua'a* and empties into Kapālama Basin. This stream was mentioned as the site where the Maui Chief Kahekili defeated Kahāhana of O'ahu circa 1780 to 1783 (Alexander 1891:123) and where residents of the area were massacred during the rebellions of the 'Ewa and Kona chiefs against the chiefs of Maui after 1783.

3.4.2 LCA Documentation

During the mid-nineteenth century Māhele, Kapālama *Ahupua'a* (along with many other lands in the islands) was awarded as part of LCA 7714-B to Moses Kekūāiwa, son of Kīna'u (who had earlier been married to Kamehameha I) and Kekūanao'a. The land passed down in turn to his sister Victoria Kamāmalu, to her brother Lot Kamehameha, to his half-sister Ruth Ke'elikōlani, and then to her first cousin, Bernice Pauahi Bishop.

Subsequent to the Māhele, individual *kuleana* lots were awarded pursuant to the 1850s Kuleana Act. Thirty *kuleana* awards were granted within and adjacent to the East Kapālama Zone, in both Kapālama and Honolulu *Ahupua'a* (Table 3 and Figure 13). The first detailed map of Kapālama, made by J. F. Brown in 1885, shows a traditional Hawaiian landscape of small *kuleana* LCA parcels extending across the Kapālama plain (Figure 14). Two of the awards were "Fort Lands" (F.L.), which were set aside from "Government Lands" for support of the garrison of the Fort in Honolulu. These Fort Land *kuleana* were granted free of charge to the awardees. The LCA testimonies for Kapālama in the vicinity of the project area (see Vol. III Appendix C) indicate that there was intensive cultivation of taro in the area, maintenance of fishponds, habitation, and some indication of the use of *kula* land. At the west end of the East Kapālama Zone, large areas of land managed by the *konohiki* (in this case Moses Kekūāiwa) were set aside as rice fields.

Table 3. LCAs in the vicinity of the East Kapālama Zone (in numerical order)

LCA Number	Contents of Award
9 F.L.	Fort Lands, two *lo'i* to Kewa
23 F.L.	Fort Lands, one house lot (one house), five *lo'i*, and one hog sty to Moeino
275 B	Nineteen or more *lo'i* at Poe Poe belonging to Henry Zupplein
591	A 9.58-acre lot to John Meek
655	One house lot (three houses) to John Kahaleaahu
826	Two *lo'i* to Keakahiwa
1034, 8400:2, 8400:3, and 8400:4	Three *lo'i* to Kuhelelei
1050	To Kaikaai
1051	One houselot, two *lo'i*, and one fishpond to Kanakaole
1053	Three *lo'i* and an ‘*auwai* at Nauala to Kanahenawai
1084	Nu'uanu for Kanaina
1101	To Kaha
1222	One house lot, five *lo'i*, and two coconut trees; Pelekane ‘Ili; awarded to Alua; also notes the presence of an ‘*auwai* and stream
1398	Three *lo'i* and two ‘*auwai* to Mumuku
1723 B:1 and 1723 B:2	One house lot (two houses, two tombs) and three *lo'i* to John Neddles
2073	Five-and-a-half *lo'i* to Kauhiwa
2107	One house lot (one house) and eight *lo'i* to Kahina
2440 B	Two house lots, one *lo'i*, and one sand pond to Kauaua
2937	One pasture (*kula* land) with taro to William Harbottle
3142	One house lot, two *lo'i*, and one sand dune to Hooliku
3144	One house lot and two *lo'i*; awarded to Noah; also notes the presence of a fishpond
3153	One house lot and three *lo'i*; Kahope ‘Ili; awarded to Nakoa; also notes the presence of an ‘*auwai* and stream
4034	One *lo'i* to Robert G. Davis
4747	One house lot (two houses) and five *lo'i* to Kama
4889	One house lot and four *lo'i* to Kalimaiki
7681	Half of Kaukahoku ‘Ili (four acres) to Kekai
8504	Eleven *lo'i* and one fishpond to George Holmes
8856	One house lot and three *lo'i*; awarded to Kalanui
11056	Four *lo'i* at Kaukahoku to Mauli

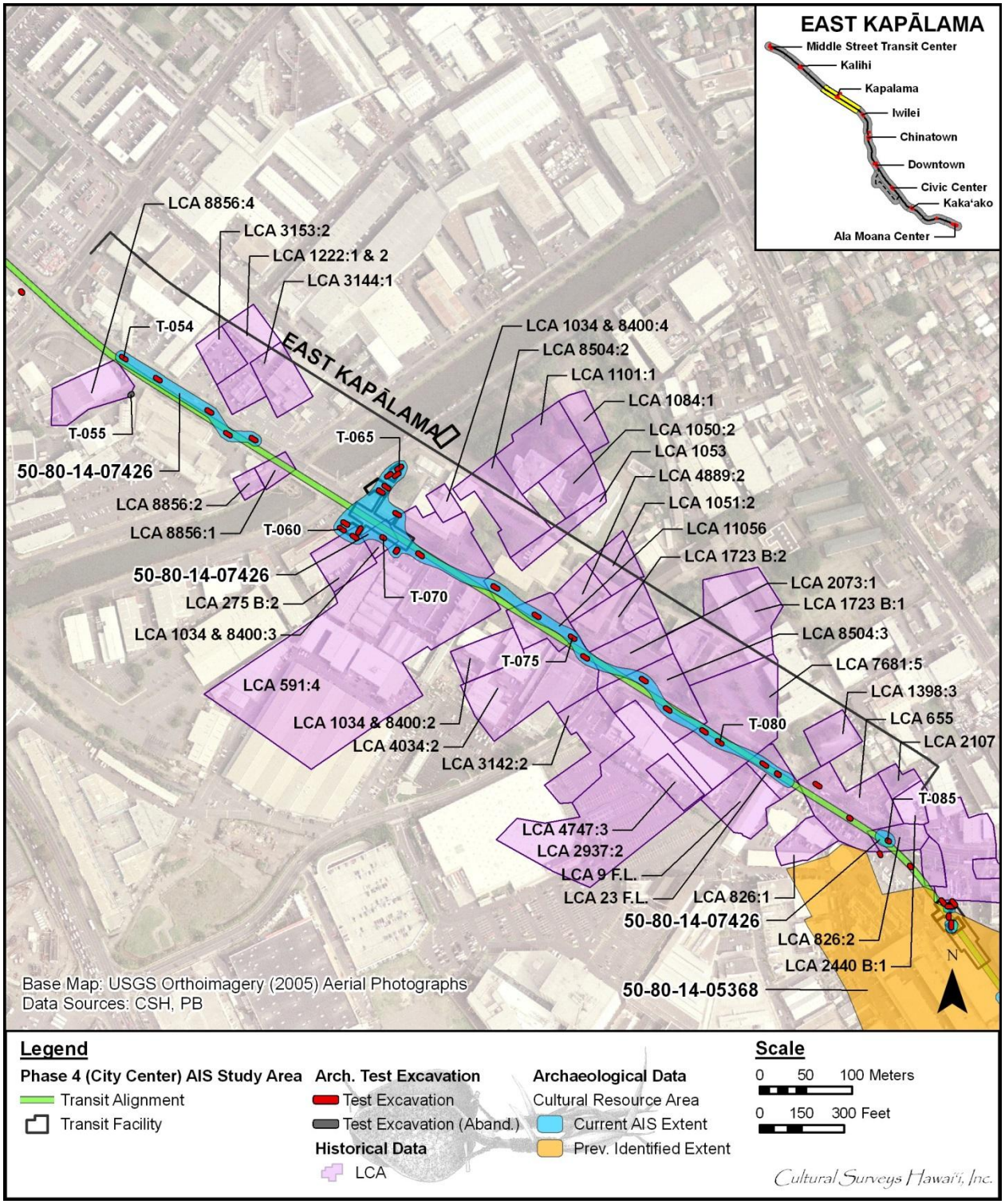


Figure 13. Aerial photograph (base map: U.S. Geological Survey Orthoimagery 2005) showing the locations of LCAs along with the HHCTCP corridor and Kapālama Station AIS excavations (T-054 through T-085) in the East Kapālama Zone

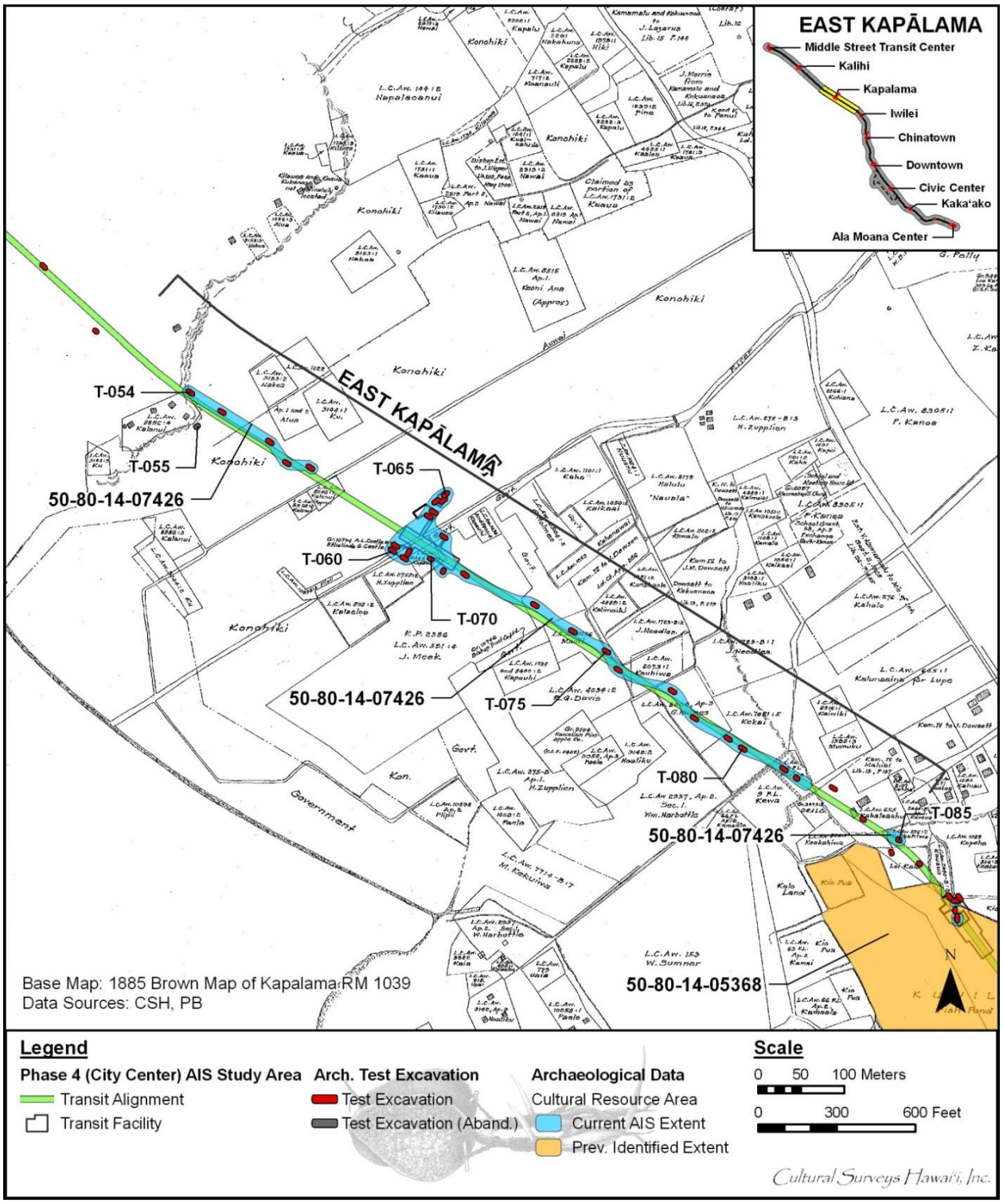


Figure 14. 1885 map of Kapālama by J. F. Brown (RM 1039), showing small *kuleana* LCA parcels extending across the Kapālama plain along with the HHCTCP corridor and Kapālama Station AIS excavations in the East Kapālama Zone

3.4.3 Historic Land Use

After wars of conquest and a circa 1804 epidemic decimated the population, Kamehameha I encouraged people to replant the land and set aside several large tracts, including tracts in Kapālama, to grow crops for their own use and for trade with visiting ships. An 1817 map of Honolulu by Kotzebue shows large taro *lo'i* on either side of Kapālama, but not yet within it (see Vol. II). However, extensive taro *lo'i* are shown in the *makai* section of Kapālama in an 1855 map by La Passe (see Vol. II). Near the end of the nineteenth century and into the beginning of the twentieth century, there was little development or urbanization in the vicinity of the East Kapālama Zone. An 1881 map of O'ahu by the Hawaiian Government Survey (see Vol. II Figure 14) shows only one road nearby. This road, which became King Street, was situated to the north and east of the East Kapālama Zone corridor. A later map, Monsaratt's 1897 map of Honolulu (see Vol. II Figure 8) shows that King Street was still the main east-west thoroughfare through the area, with few side streets extending from it. The tracks of the OR&L railroad are shown paralleling King Street. This map also shows that the taro *lo'i* have mostly been converted into rice and pineapple fields. The 1914 Sanborn Series Honolulu maps show development at the two ends of the East Kapālama Zone. It is of note that no 1914 Sanborn maps were made for the majority of the East Kapālama Zone, indicating that no development was present in this area as it was still engaged in agriculture. Sheet 15 of the 1914 Sanborn Series maps shows development surrounding Kūwili Fishpond, with the land to the west described as a "sugar cane field" (Figure 15). By 1919, a new section of OR&L railroad track was shown *makai* of the East Kapālama Zone (Figure 16). According to the 1927 and 1950 Sanborn Series Honolulu maps (Figure 17 and Figure 18), a 1933 U.S. Army War Department Fire Control map (Figure 19), and a 1943 U.S. Army War Department map (see Vol. II), the street grid system within the East Kapālama Zone was being developed during that time, including the present road alignment known as Dillingham Boulevard, and development was encroaching on the East Kapālama Zone from both the east and the west. This development into the East Kapālama Zone suggests that the value of the land for habitation and business development surpassed its value as agricultural land during this time. This development coincided with the construction of Kapālama Basin and Kapālama Canal. By the 1970s, as a 1978 U.S. Geological Survey orthophoto shows, intensive urban/industrial development had taken place (see Vol. II Figure 21).

3.4.4 Settlement Pattern Summary

The land around the East Kapālama Zone in Kapālama and Honolulu *Ahupua'a* offered desirable environmental conditions for traditional Hawaiian subsistence practices. The well-watered floodplain would have allowed for the development of an extensive taro *lo'i* system, and the protected shoreline and fringing reef would have allowed for ease of ocean access to the productive near-shore fisheries. LCA research confirms this agricultural pattern, showing an intense area of taro cultivation interspersed with scattered houses as well as some *kula* lands and fishponds.

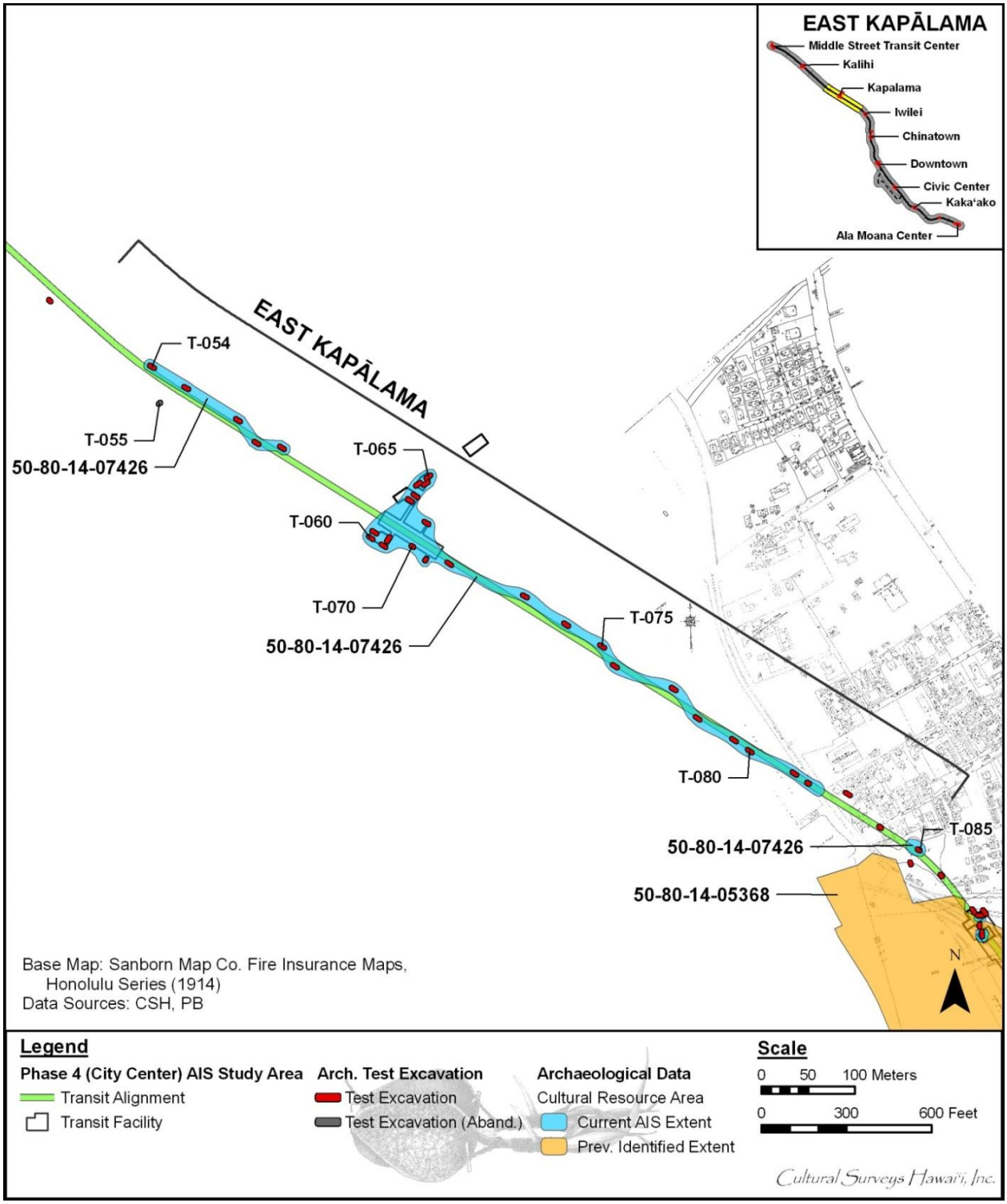


Figure 15. 1914 Sanborn Series maps showing a portion of the HHCTCP corridor in the East Kapālama Zone with development surrounding Kūwili Fishpond (5368) in the lower right corner and a “sugar cane field” noted to the west where the maps do not continue (Sanborn Map Company 1914)

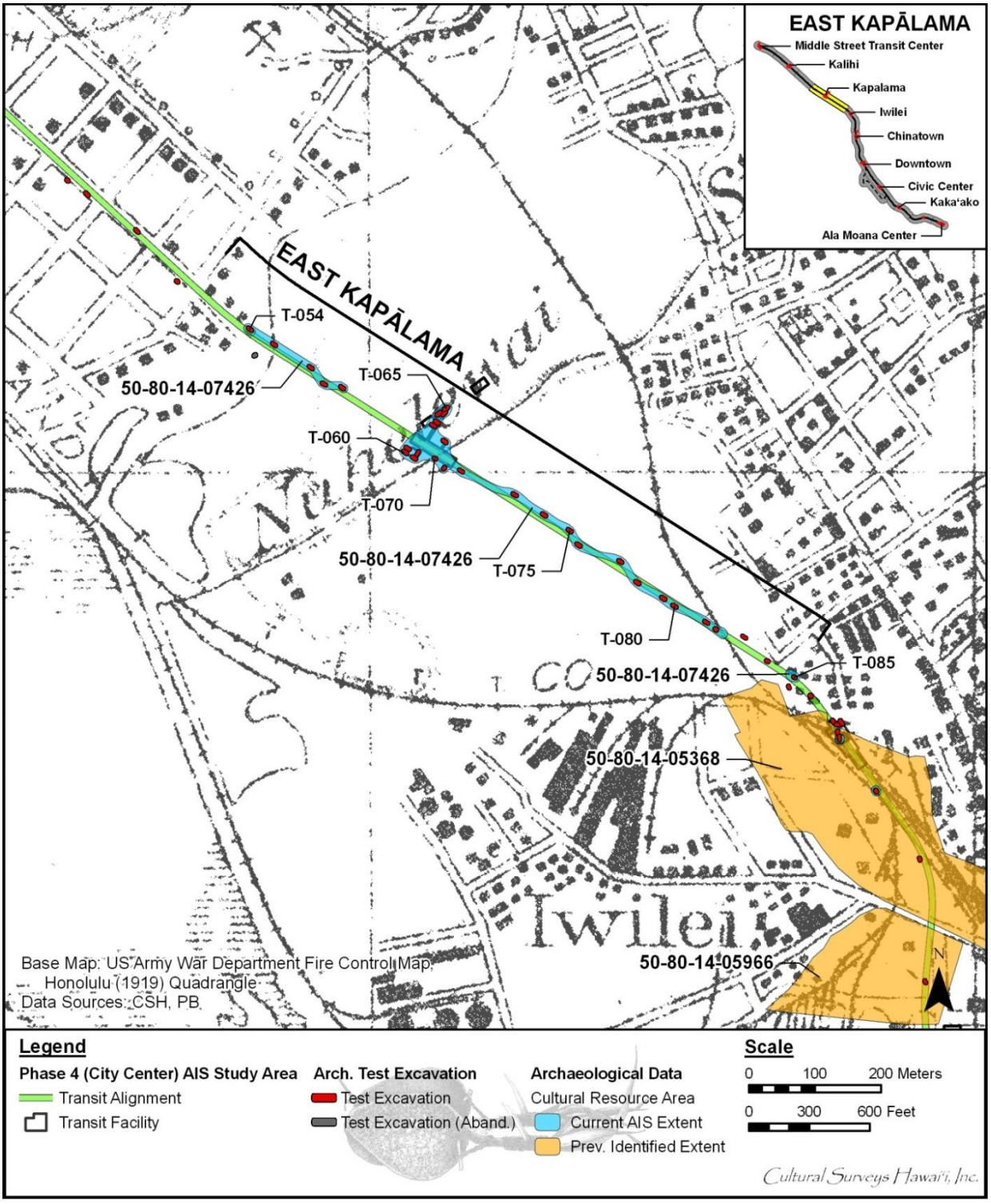


Figure 16. 1919 U.S. Army War Department Fire Control map, Honolulu Quadrangle, showing the HHCTCP corridor and Kapālama Station AIS excavations (T-054 through T-085) in the East Kapālama Zone; note the OR&L railroad tracks on either side and crossing of the corridor

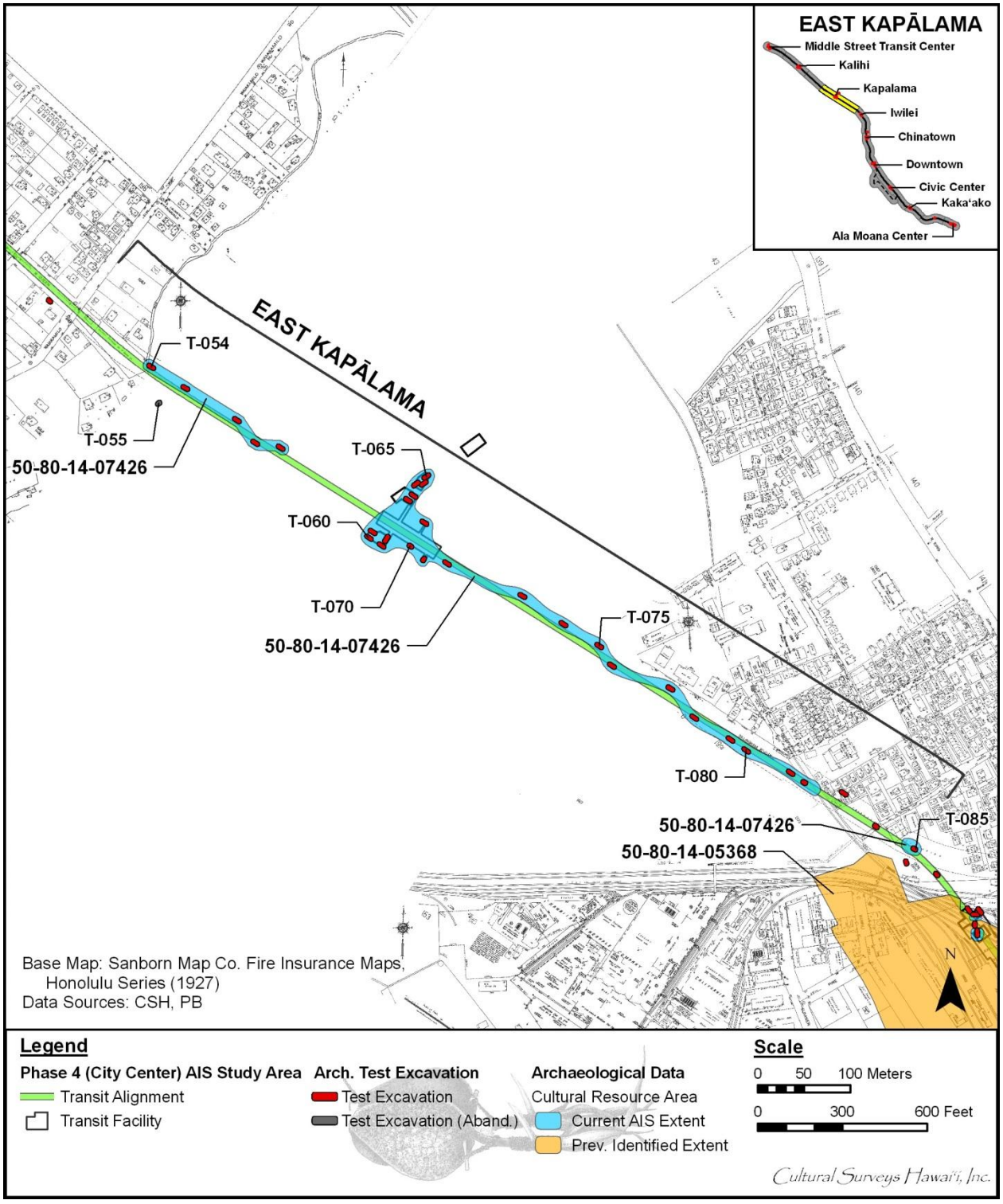


Figure 17. 1927 Sanborn Series maps showing the HHCTCP corridor in the East Kapālama Zone, encroaching development in the area, and the developing street grid system (Sanborn Map Company 1927)

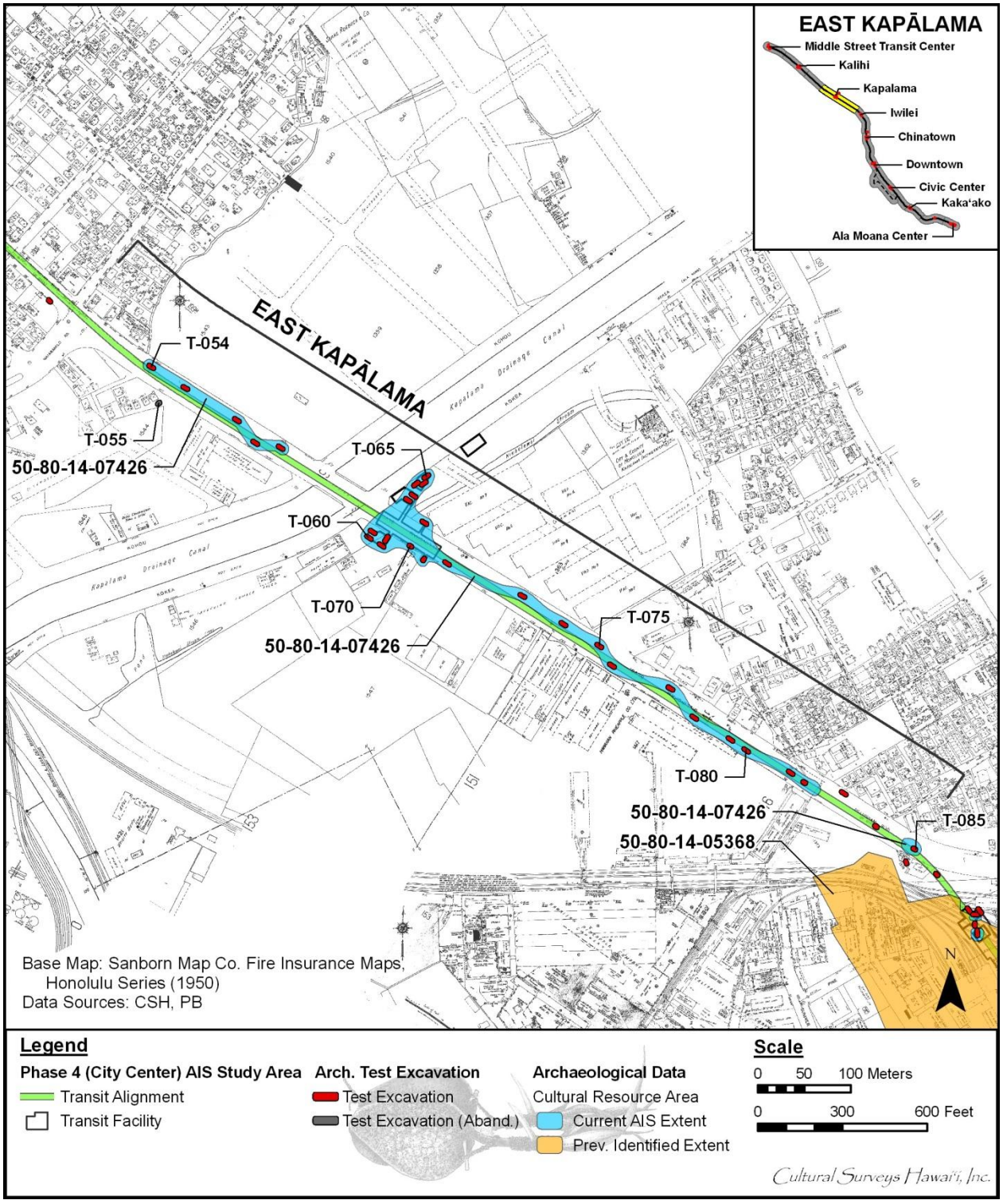


Figure 18. 1950 Sanborn Series maps showing the HHCTCP corridor in the East Kapālama Zone, encroaching development in the area, and the developing street grid system (Sanborn Map Company 1950)

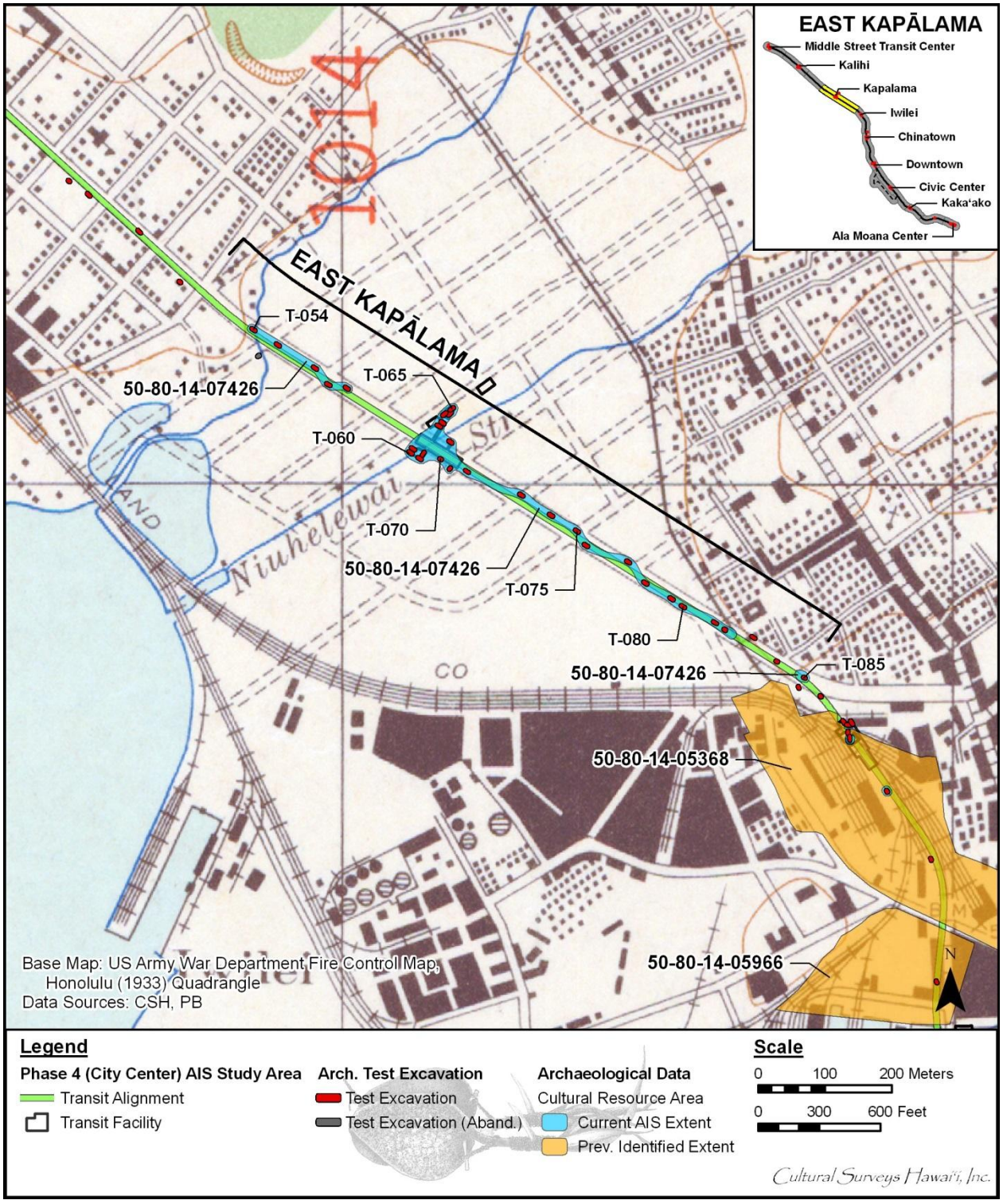


Figure 19. 1933 U.S. Army War Department Fire Control map, Honolulu Quadrangle, showing the HHCTCP corridor and Kapālama Station AIS excavations (T-054 through T-085) in the East Kapālama Zone

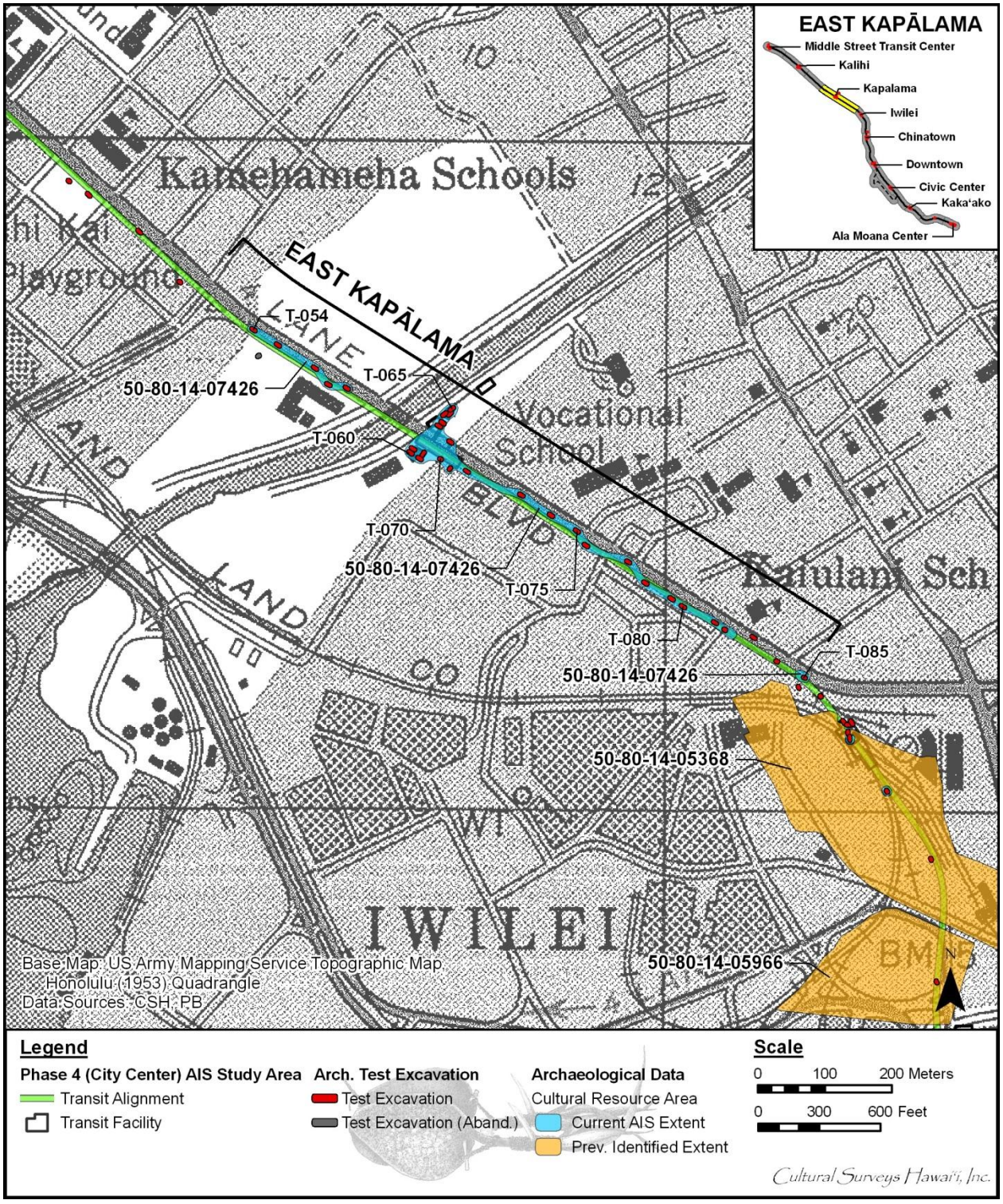


Figure 20. 1953 U.S. Army Mapping Service map, Honolulu Quadrangle, showing the HHCTCP corridor and Kapālama Station AIS excavations (T-054 through T-085) in the East Kapālama Zone

3.5 Previous Archaeology

Few archaeological studies have been conducted in Kapālama in the vicinity of the East Kapālama Zone, and only four studies have been conducted directly adjacent to the East Kapālama Zone (Table 4 and Figure 21). Of note among the studies conducted in the vicinity of the East Kapālama Zone are that three of them (Dunn, Kalima, and Goodfellow 1991; Jourdane 1994; and Moore and Kennedy 1999) identified human skeletal remains (SIHP #50-80-14-3373, #50-80-14-4929, and #50-80-14-5581, respectively). In all three cases, the remains were believed to be post-Contact. All of the studies were located outside of the East Kapālama Zone corridor. An additional cultural resource was identified adjacent to and to the southeast of the East Kapālama Zone and will be discussed under the Iwilei Geographic Zone: the previously discussed Kūwili Fishpond (SIHP #50-80-14-5368; Athens and Ward 1997; Hammatt, Hazlett, and Shideler 2008; and McGerty, Dega, and Spear 1997).

***Mauka* of Dillingham Boulevard between Waiakamilo Road and Kohou Street (Tulchin and Hammatt 2013 [draft] and Pammer and Monahan 2011)**

The Tulchin and Hammatt (2013 [draft]) study was an archaeological inventory survey plan that involved some subsurface testing (13 trenches so far; this project was still ongoing). Their study was divided into three phases of work, with only Phase 1 directly adjacent to the East Kapālama Zone corridor (Phase 2 of their project was located one block *mauka* of the East Kapālama Zone, while Phase 3 was located *makai* and ‘Ewa of the East Kapālama Zone). To date, subsurface excavation has been performed only in Phases 1 and 2. Three (one of which was abandoned) of their 13 trenches were located adjacent to the East Kapālama Zone corridor within their Phase 1 project area, at the Diamond Head/*mauka* intersection of Dillingham Boulevard and Waiakamilo Road. Their Test Trench 3 (TT-3) extended to the relatively shallow limestone shelf, while their TT-5 extended to deep fill deposits down to the water table. This indicated that the edge of the limestone shelf was located between these two test trenches, with TT-3 on the edge of the bluff and TT-5 located off of the bluff and within the adjacent former agricultural fields. The Tulchin and Hammatt study designated these two locations as separate stratigraphic zones. TT-3 was located in Stratigraphic Zone 1, which was identified as a low ridge overlooking wetlands, with potentially culturally enriched sediment. TT-5 was located in Stratigraphic Zone 2, which was described as lowland wetlands used for taro and rice cultivation and subsequently filled in during intensive land reclamation activities.

The Pammer and Monahan (2011) study was an archaeological literature review and field inspection of a parcel located at the *mauka*/’Ewa intersection of Dillingham Boulevard and Kohou Street. The study conducted limited subsurface testing involving five trenches. Two of their five trenches (TT-4 and TT-5) were adjacent to the East Kapālama Zone corridor. TT-4 and TT-5 contained thick fill deposits overlying former agricultural soils; these excavations were very similar to the adjacent HHCTCP excavations at T-057, T-058, and T-059.

Table 4. Previous archaeological studies conducted adjacent to the East Kapālama Zone (arranged chronologically)

Author	SIHP #50-80-14	Report Description and Findings
O'Hare, Shideler, and Hammatt 2010	N/A	Archaeological literature review and field inspection for the Honolulu Community College Advanced Technology Training Center Project; no subsurface testing conducted, recommended an archaeological monitoring program
Pammer and Monahan 2011	N/A	Archaeological literature review and field inspection with limited subsurface testing for the Kapālama Shopping Center Redevelopment Project; no historic properties identified, but natural *lo'i* sediments observed beneath various thick fill layers
Medina, Lance, and Hammatt 2012 (draft)	N/A	Archaeological monitoring report for traffic control signal improvements along Dillingham Boulevard on either side of Kapālama Canal; no historic properties or undisturbed cultural deposits observed
Tulchin and Hammatt 2013 (draft)	N/A	Archaeological inventory survey plan with subsurface testing for Kamehameha Schools lands; testing revealed two stratigraphic zones: 1) a low ridge overlooking wetlands, with potentially culturally enriched sediment; and 2) lowland, wetlands used for taro and rice cultivation, subsequently filled-in during intensive land reclamation activities

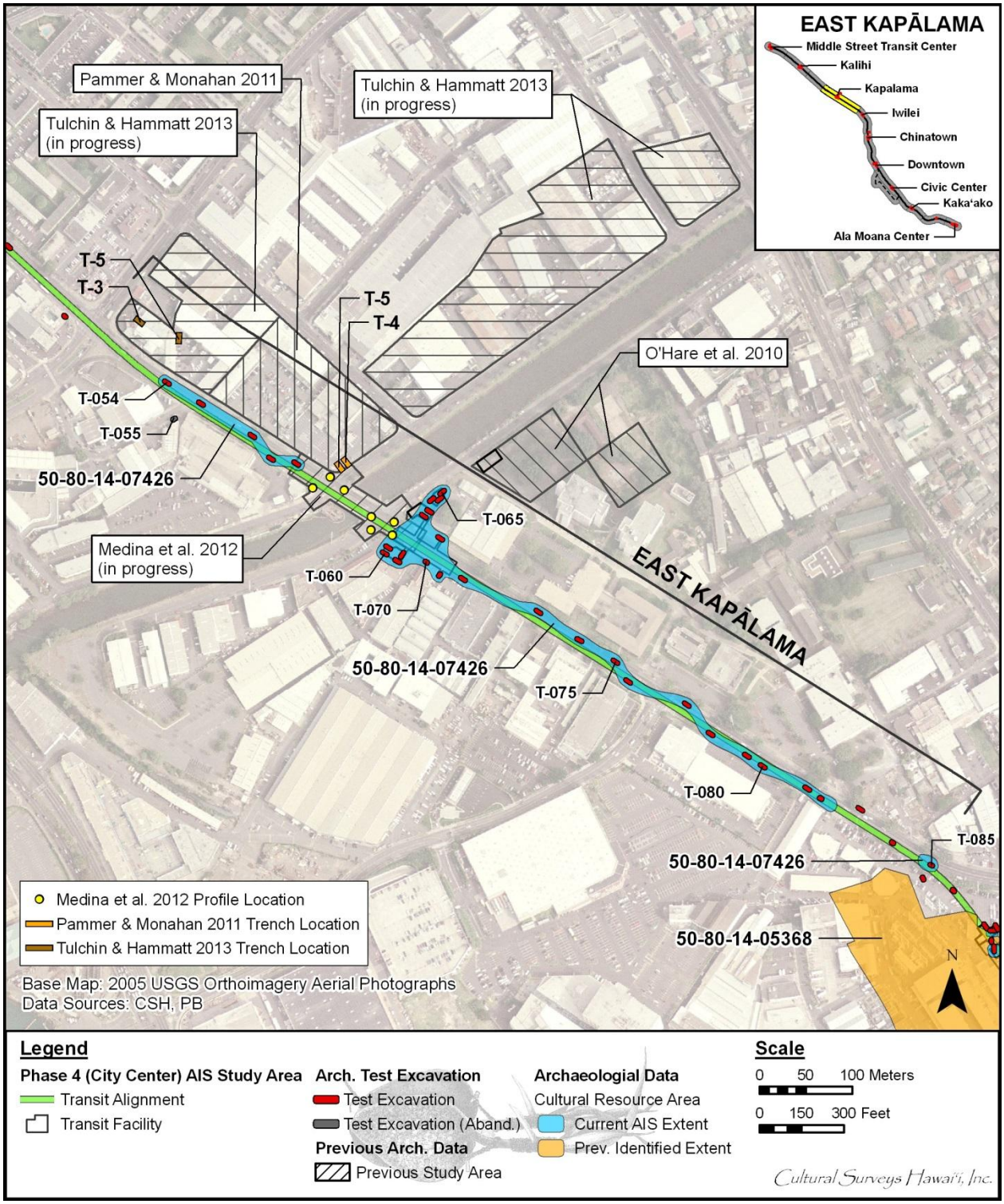


Figure 21. Previous archaeological studies in the vicinity of the East Kapālama Zone (base map: U.S. Geological Survey Orthoimagery 2005); test excavations of prior studies that are immediately adjacent to the East Kapālama Zone corridor are also shown

Dillingham Boulevard between Kohou and Kokea Streets (Medina, Lance, and Hammatt 2012 [draft])

The Medina, Lance, and Hammatt (2012 [draft]) study was an archaeological monitoring program for traffic control signal improvements along Dillingham Boulevard on both sides of Kapālama Canal. During monitoring, seven sediment profiles were recorded. In six of the profiles, subsurface deposits were characterized by few fill layers over locally-procured silty clay loam sediment that was likely the result of dredging of Kapālama Canal. The seventh profile revealed modern sod overtop locally procured silty clay loam sediment overtop a layer of organically enriched sediment. This profile was similar to the adjacent HHCTCP excavations at T-060 and T-061, which contained various fill layers over agricultural/aquacultural sediments (likely representing taro and/or rice *lo'i*).

Honolulu Community College (O'Hare, Shideler, and Hammatt 2010)

O'Hare, Shideler, and Hammatt (2010) conducted an archaeological literature review and field inspection of a parcel located on the northwest side of the Honolulu Community College campus. The study did not conduct subsurface testing and no historic properties were identified. Background research conducted for the study suggested that intact pre-Contact and early post-Contact cultural deposits associated with traditional Hawaiian habitation, agriculture, and burials may lie undisturbed beneath fill layers in the area. Additionally, post-Contact cultural deposits associated with western settlement and residential development from the nineteenth and twentieth centuries were also thought to be possibly present.

3.6 Modern Land Use and Built Environment

The East Kapālama Zone traverses an urban environment through the neighborhoods of Kapālama and Iwilei. The centerline of the project alignment within the East Kapālama Zone lies within Dillingham Boulevard. Parcels bordering Dillingham Boulevard contain largely commercial structures, with some industrial warehouses and parking lots, with several roads, alleyways, and driveways extending out from Dillingham Boulevard. Dillingham Boulevard itself has been lined with cut basalt curbstones. A massive utility corridor was also present throughout the East Kapālama Zone containing electrical, gas, water, sewer, and storm lines. The number and distribution of these existing utilities indicate that this East Kapālama portion of Dillingham has been heavily disturbed in the past.

3.7 Test Excavation 54 (T-054)

***Ahupua'a*:**	Kapālama
LCA:	N/A
TMK #:	1-5-021 [Plat]
Elevation Above Sea Level:	2 m
UTM:	616661.37 mE, 2358340.66 mN
Max Length/Width/Depth:	7.3 m / 1 m / 1.9 mbs
Orientation:	128 / 308º TN
Targeted Project Component:	Utility relocation (electric line)
USDA Soil Designation:	Ewa silty clay loam (EmA)

Setting: Test Excavation 54 (T-054) was located approximately 225 m northwest of Kapālama Stream and 20 meters northeast of the Benjamin Moore Rainbow State Paint store, in the left lane of the westbound lanes of Dillingham Boulevard near the Waiakamilo Road intersection. Utilities near T-054 included a water line 4.3 m northeast and a sewer line 2.8 m southwest. The excavation surface was level with the surrounding land surface, sloping gently to the east.

Summary of Background Research and Land Use: Brown's 1883 map of Kalihi and Kapālama indicated T-054 was 300 m northeast of the shoreline next to a small stream. Brown's 1883 map of Kalihi and Kapālama showed T-054 at the base of a small *pali* and immediately adjacent to LCA 8856:4 awarded to Kalanui. LCA 8856:4 was situated atop a bluff and contained a house lot and three taro *lo'i*. Monsarrat's 1897 map of Honolulu indicated that T-054 was located within agricultural lands, possibly pineapple plantations. The 1919 landscape around T-054 was dramatically altered with roads and residential developments, according to the 1919 U.S. Army War Department Fire Control map. The 1933 and 1943 Army U.S. Army War Department maps indicated that surrounding areas continued to develop and multiple new developments were planned. By 1953, T-054 was within the completed Dillingham Boulevard and the surrounding areas were established as part of the formal Kalihi and Kapālama area. The 1919 U.S. Army War Department Fire Control map indicated a small stream was present 31 m southeast of T-054, and also the Niuhelewai Stream, approximately 350 m southeast of T-054. Both streams were indicated in the 1933 U.S. Army War Department Fire Control map as well. By 1943, the small stream adjacent to T-054 was no longer present and Nuhelewai Stream appeared channelized, according to the 1943 U.S. Army War Department map. The 1953 U.S. Army Mapping Service map showed Niuhelewai Stream, by this time renamed Kapālama Stream, being channeled into Kapālama Basin.

Few archaeological studies have been conducted in the West Kapālama Zone near T-054. Tulchin and Hammatt (2013, in progress) conducted an archaeological inventory survey for Kamehameha Schools with limited sub-surface testing 13 m to the northeast. Pammer and Monahan (2011) performed an archaeological literature review and field inspection with limited subsurface testing for the Kapālama Shopping Center Redevelopment Project 50 m east of T-054. No historic properties were identified but *lo'i* sediments were observed beneath fill layers.

O’Hare et al. (2010) performed an archaeological literature review and field inspection for the Honolulu Community College Advanced Technology Training Center Project 340 m northeast of T-054. Medina et al. (2012, in progress) monitored construction along Dillingham Boulevard 184 m southeast of T-054. T-054 was also within the Kapālama ethnohistoric study area conducted by Uyeoka et al. (2009).

Documentation Limitations: T-054 was excavated to beneath the water table at 1.85 mbs to the coral shelf at 1.9 mbs. Excavation was confined to the northwest half of T-054 due to a concrete slab present at 0.2 mbs. Safety concerns regarding collapsing sidewalls and instability of the loosely compacted fill layers prevented entry into T-054.

Stratigraphic Summary: The stratigraphy of T-054 consisted of several fill strata overlying natural sediment and the coral shelf. Observed strata included asphalt (Ia), extremely cobbly loam base course (Ib) gravelly clay loam, compacted crushed coral fill (Ic), extremely gravelly clay loam fill (Id), stony clay loam fill (Ie), and natural clay alluvium (II). The stratigraphy conformed to the USDA soil survey designation of Ewa silty clay loam (EmA).

Artifact Discussion: See sample results as follows.

Feature Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were observed.

Sample Results: One bulk sediment sample was collected from Stratum II between 1.7-1.9 mbs (3.5 L). The sample was removed from the backhoe bucket and is, therefore, not depicted on the profile. The sample was wet screened and contained natural marine Gastropod shells (0.5 g), natural Tellinidae *Tellina palatam* (1.6 g), wood (0.1 g), glass (1.2 g) and ceramics (0.3 g). The sample results indicated that Stratum II was a natural alluvial/wetland deposit in the intertidal zone with a sedimentary matrix containing naturally occurring marine shell organisms with historic disturbance, as evidenced by the presence of glass and ceramic fragments that were likely introduced during historic agricultural endeavors.

GPR Discussion: A review of amplitude slice maps indicated no linear feature although a concrete slab was encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.75 mbs.

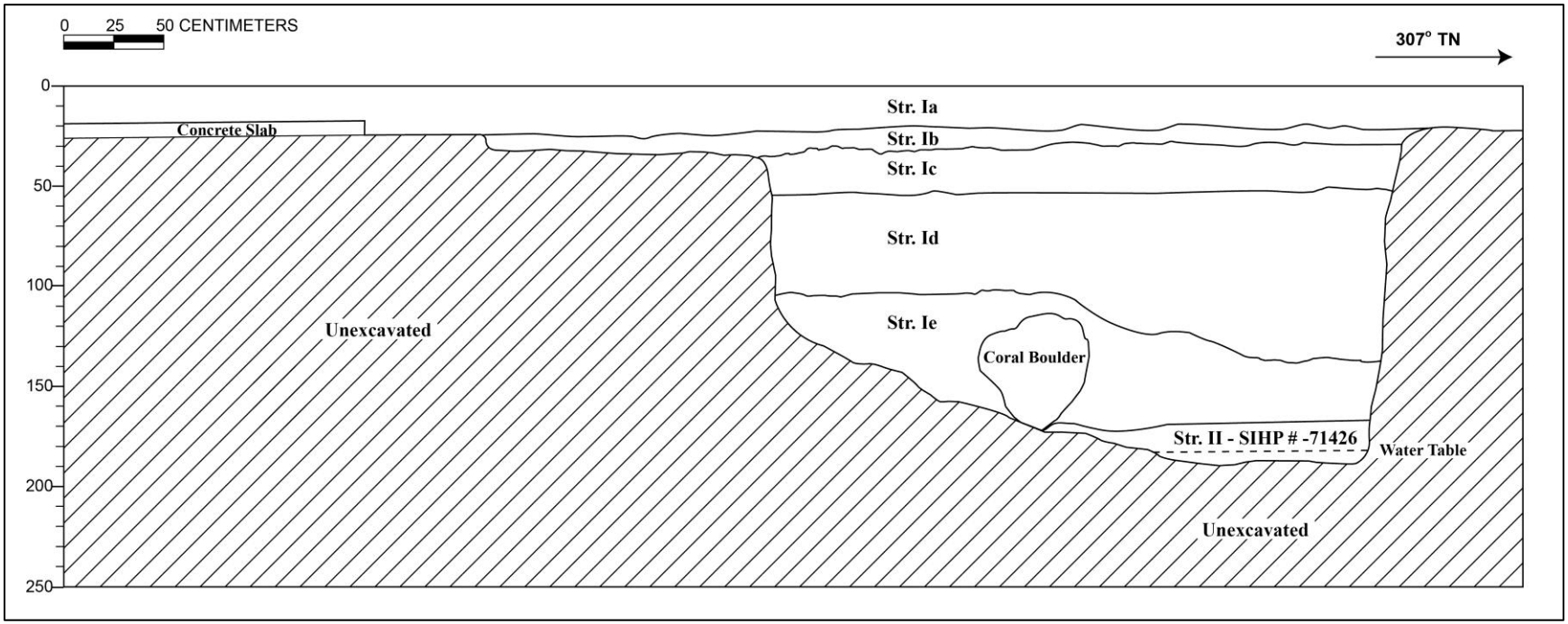
GPR depth profiles for T-054 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity which occurred around 0.20 mbs. An anomaly was observed in the profile and corresponded to the concrete slab that was encountered during excavation. The maximum depth of clean signal return was approximately 1.0 mbs.

Summary: T-054 was excavated to beneath the water table at 1.85 mbs, to the coral shelf at 1.9 mbs. The stratigraphy of T-054 consisted of several fill strata (Ia-Ie) overlying natural sediment (II) to the coral shelf. The stratigraphy conformed to the USDA soil survey designation of Ewa silty clay loam (EmA). The sample results indicated that Stratum II was a natural alluvial/wetland deposit in the intertidal zone with a sedimentary matrix containing naturally

occurring marine shell organisms with historic disturbance, as evidenced by the presence of glass and ceramic fragments that were likely introduced during historic agricultural endeavors. Stratum II was considered to be a component of SIHP #50-80-14-7426 (see Volume I).

T-054 general location, view to southeast

T-054 southwest wall profile, view to west



T-054 southwest profile wall

T-054 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-25	Asphalt
Ib	20-35	Fill; 10 YR 2/1 (gray); extremely cobbly loam, structureless, single-grain; moist, loose consistency; terrigenous origin; abrupt, smooth lower boundary; manufactured basalt cobbles (surge rock), base course
Ic	30-55	Fill; 10 YR 3/3 (dark brown) with common, very coarse mottles of 10 YR 8/1 (white); gravelly clay loam; weak, fine, crumb structure; moist, friable consistency; slightly plastic; mixed origin; abrupt, smooth lower boundary; compacted crushed coral fill
Id	55-140	Fill; 10 YR 3/3 (dark brown); extremely gravelly clay loam; weak, fine, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; extremely gravelly clay loam fill with reworked local alluvium
Ie	105-175	Fill; 10 YR 3/3 (dark brown); stony clay loam; coarse, blocky structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; fill with reworked local alluvium
II	170-190	Natural; 10 YR 3/1 (very dark gray); clay; structureless, massive; wet, sticky consistency; very plastic; terrigenous origin; lower boundary not visible; natural alluvial deposit; component of SIHP #50-80-14-7426.

3.8 Test Excavation 55 (T-055)

***Ahupua'a*:** Kapālama

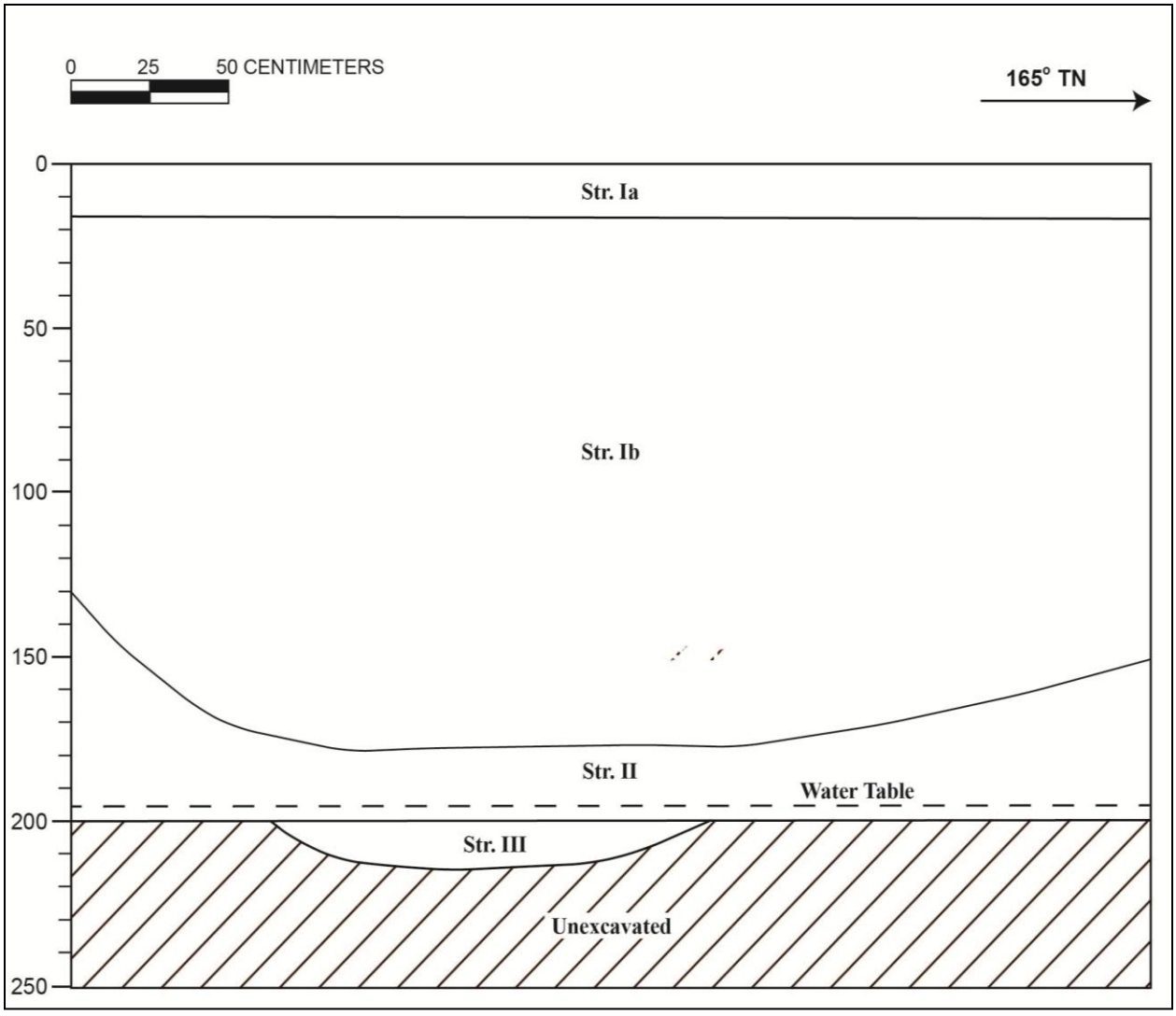
LCA : 8856:4

TMK #: 1-5-020: 007 [Plat]

Setting: Test Excavation 55 (T-055) was proposed to be located within the sidewalk on the southeast side of Colburn Street approximately 16.0 m southwest of the Dillingham Boulevard intersection. T-055 was abandoned because of a conflict with a storm drain. However, the test excavation was situated 15-20 m southwest of a grease trap excavation within a private establishment. The excavation for the grease trap was documented. Several bottles were encountered during the excavation but were not removed from the private property. Bottles were not documented since they lacked datable attributes such as trademarks or lettering. Bottle types included beer and/or soda and possible condiment. All of the bottles appeared to be machine blown, dating to the twentieth century. The locations of T-055 and the grease trap excavation are within the boundary of SIHP# 50-80-14-7426 (see Volume I for a description of this cultural resource).

Location of the grease trap excavation approximately 15-20 m northeast of abandoned T-055, view to the west

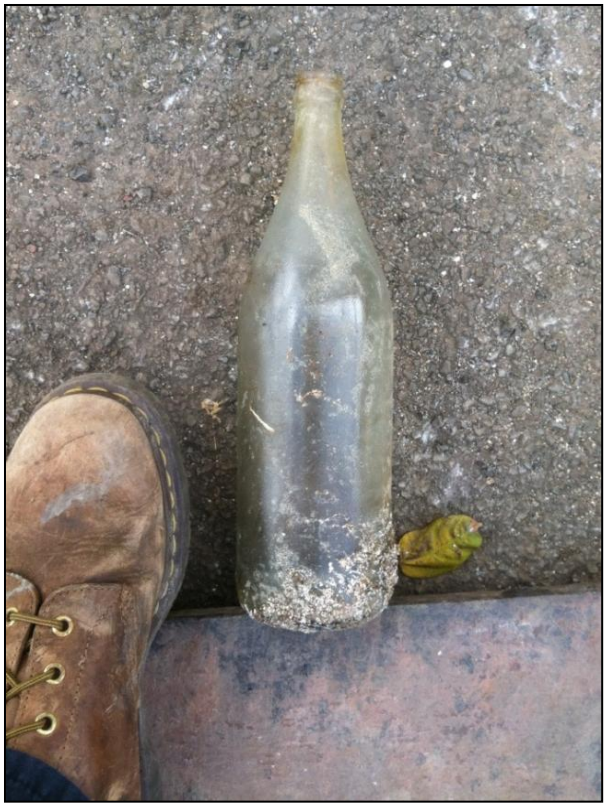
Profile of the east wall in grease trap excavation, view to the northeast



East wall profile from grease pit opening

T-055 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-16	Asphalt, paved surface
Ib	16-180	Fill; 10 YR 3/2 (very dark grayish brown); structureless, single-grain; extremely cobbly gravelly loam; moist, loose consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; construction fill/debris of bricks, cinderblocks, and concrete
II	130-200	Fill; 10 YR 4/2 (dark grayish brown); very gravelly sandy loam; structureless, single-grain; moist, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary
III	200-218	Fill; GLEY 2 4/1 (dark bluish gray); clay; structureless, massive; wet, sticky consistency; plastic; marine origin; lower boundary not visible



Bottle observed during excavation, not collected (private property)

Assortment of bottles observed during excavation, not collected (private property)

3.9 Test Excavation 56 (T-056)

***Ahupua'a*:**	Kapālama
LCA:	N/A
TMK #:	1-5-021 [Plat]
Elevation Above Sea Level:	1.65 m
UTM:	616698.31 mE, 2358318.24 mN
Max Length/Width/Depth:	6.1 m / 0.70 m / 1.66 mbs
Orientation:	128 / 308º TN
Targeted Project Component:	Utility relocation (36" Sewer)
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 56 (T-056) was located within the left lane of the westbound lanes of Dillingham Boulevard. T-056 was located east of the Colburn Street intersection and west of the Kapālama Shopping Center. Utilities in the vicinity of T-056 included two water lines (3.5 m north and 2.8m west), a sewer line (3.0 m south), and a gas line (2.8 m west). The land surface slopes gently toward Kapālama Stream, located 183 m to the southeast.

Summary of Background Research and Land Use: Brown's 1885 map of Kapālama depicted T-056 near the base of a small *pali* (cliff) within Konohiki lands. Multiple small LCAs were present in the vicinity of T-056. An '*auwai* (irrigation channel) was located approximately 146 m southeast of T-056. Monsarrat's 1897 map of Honolulu depicted T-056 within rice fields. The 1919 U.S. Army War Department Fire Control map depicted expansive infrastructure and residential development in the area of T-056. The 1933 and 1943 U.S. Army War Department maps also documented increased development. By 1953, T-056 was located within the Dillingham Boulevard right-of-way.

Few archaeological studies were conducted in the West Kapālama Zone near T-056. Tulchin and Hammatt (2013, in progress) conducted an archaeological inventory survey 13.0 m to the northwest of T-056. Pammer and Monahan (2011) completed an archaeological literature review and field inspection with limited subsurface testing for the Kapālama Shopping Center Redevelopment Project located 12.0 m north of T-056. No historic properties were identified, but *lo'i* sediments were observed beneath fill layers. O'Hare et al. (2010) performed an archaeological literature review and field inspection for the Honolulu Community College Advanced Technology Training Center Project 305 m to the northeast. Medina et al. (2012, in progress) monitored construction along Dillingham Boulevard 125 m southeast of T-056. T-056 was also within the Kapālama ethnohistoric study area conducted by Uyeoka et al. (2009).

Documentation Limitations: T-056 was excavated to beneath the water table at 1.53 mbs, to a depth of 1.66 mbs. The northwestern portion of T-056 was not excavated to avoid undermining a large concrete slab that extended into the southwest sidewall.

Stratigraphic Summary: The stratigraphy of T-056 consisted of fill strata to the base of excavation. Observed stratigraphy included asphalt (Ia), extremely gravelly sand (Ib-Id), very gravelly to cobbly sandy clay loam fill (Ie), and extremely gravelly silt loam fill (If). Modern

construction debris, including rubber, concrete fragments, and metal fragments, were observed within Stratum Ie and If, but were not collected. The stratigraphy conformed to the USDA soil survey designation of Fill land (FL).

Artifact Discussion: No artifacts were observed.

Feature Discussion: No features were observed.

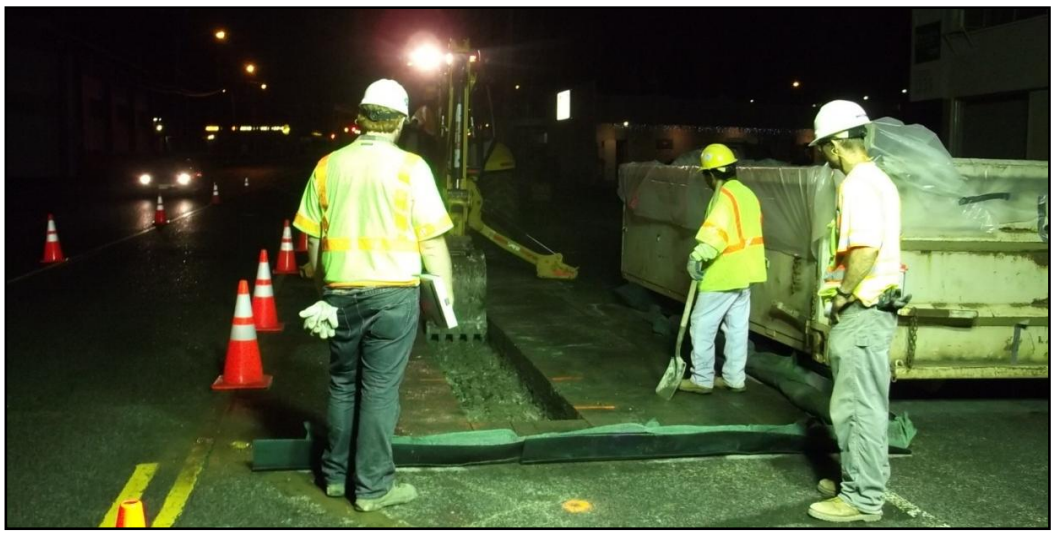
Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were observed.

Sample Results: No sample analysis was conducted.

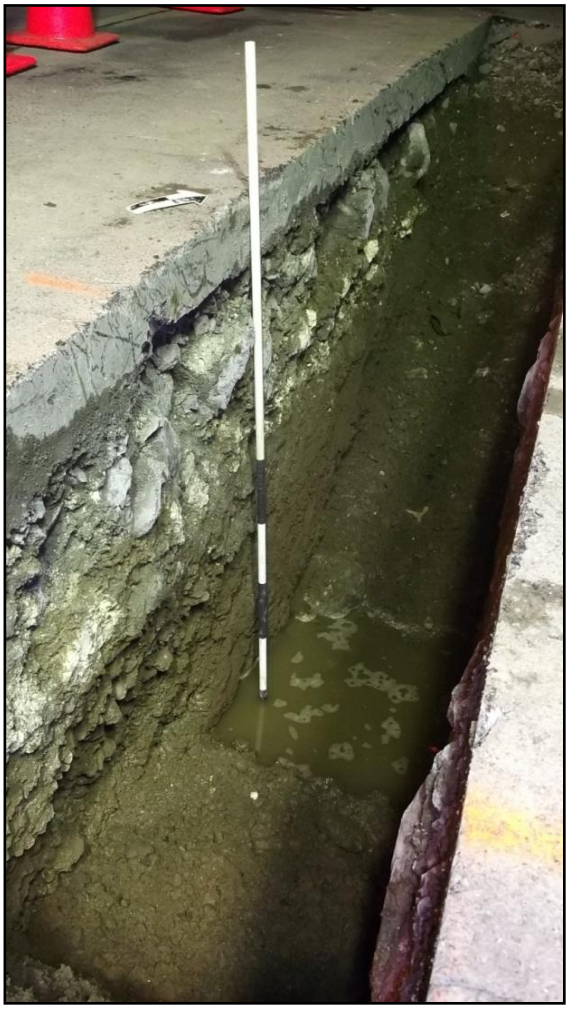
GPR Discussion: A review of amplitude slice maps indicated a linear feature that was not encountered but a concrete slab that was not observed on the slice maps was encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.50 mbs.

GPR depth profiles for T-056 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity which occurred around 0.15 mbs. An anomaly was observed in the profile that was not encountered, but a concrete slab that was not observed on the profile was encountered during excavation. The maximum depth of clean signal return was approximately 1.10 mbs.

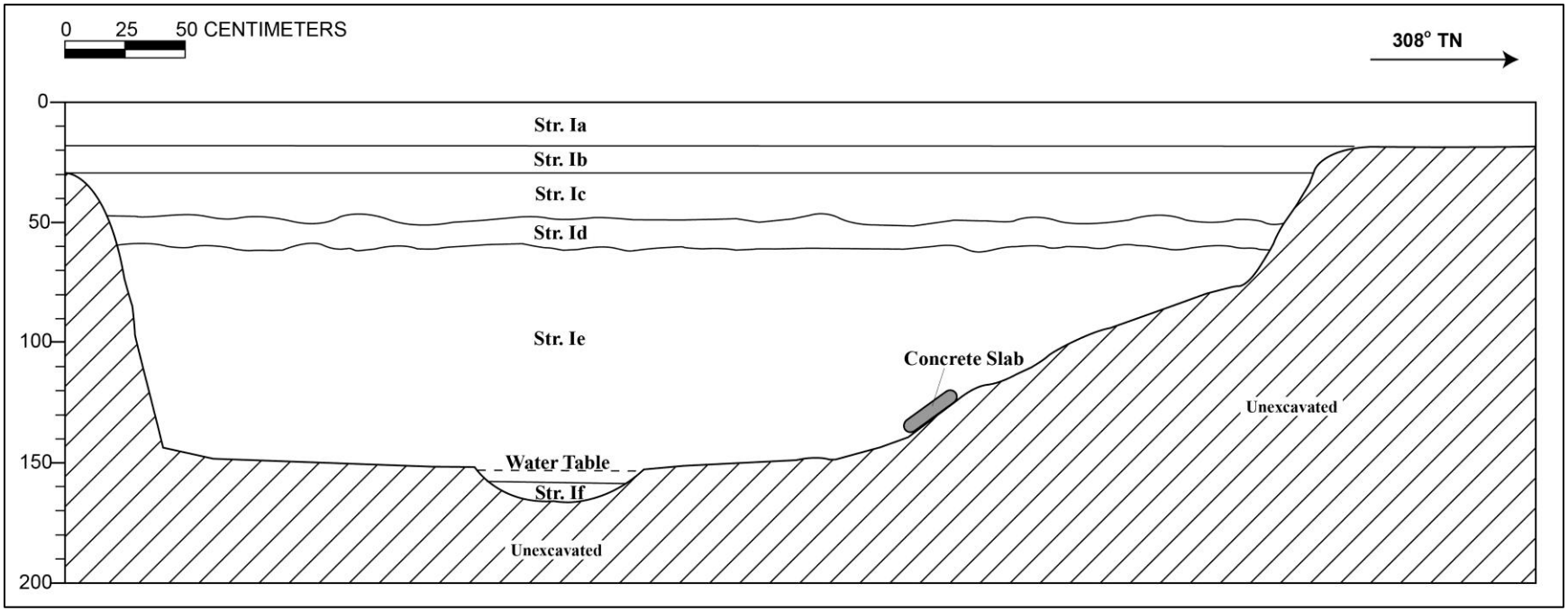
Summary: T-056 was excavated to beneath the water table at 1.53 mbs, to a depth of 1.66 mbs. The stratigraphy consisted of fill strata (Ia-If) to the base of excavation. No natural sediment was observed. The stratigraphy conformed to the USDA soil survey designation of Fill land (FL). No natural sediment was observed. T-056 is located within the boundary of SIHP# 50-80-14-7426 (see Volume I for a description of this cultural resource). No cultural resources were identified.



T-056 general location, view to northwest



T-056 southwest wall profile, view to west



T-056 southwest wall profile

T-056 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-18	Asphalt road surface
Ib	18-30	Fill; 10 YR 5/2 (grayish brown); extremely gravelly sand; structureless, single-grain; extremely gravelly sand; moist, loose consistency; non-plastic; terrigenous origin; very abrupt, smooth lower boundary; manufactured gravel base course
Ic	30-48	Fill; 10 YR 4/1 (dark gray); extremely gravelly sand; structureless, massive; indurated consistency; mixed origin; very abrupt, smooth lower boundary; CLSM
Id	48-63	Fill; 10 YR 8/2 (very pale brown); extremely gravelly sand; structureless, single-grain; dry, loose consistency; non-plastic; marine origin; very abrupt, smooth lower boundary; crushed coral fill
Ie	60-158	Fill; 10 YR 4/3 (brown); very gravelly to cobbly sandy clay loam; structureless, single-grain; moist, loose consistency; slightly plastic; terrigenous origin; lower boundary not visible below water table; contained red brick, metal, concrete slab, round-headed nail, plastic; mixed fill of local alluvium and gravel
If	158-166	Fill; 10 YR 2/2 (very dark brown); extremely gravelly silt loam; structureless, single-grain; wet, non-sticky consistency; non-plastic; terrigenous origin; lower boundary not visible; did not resemble natural alluvium or stream bank sediment-fill; component of SIHP #50-80-14-7426.

3.10 Test Excavation 57 (T-057)

***Ahupua'a*:**	Kapālama
LCA:	N/A
TMK #:	1-5-022
Elevation Above Sea Level:	1.54 m
UTM:	616754.03 mE, 2358283.83 mN
Max Length/Width/Depth:	7.25 m / 0.75 m / 1.66 mbs
Orientation:	122 / 302º TN
Targeted Project Component:	Utility relocation
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 57 (T-057) was located in the left lane of the westbound lanes of Dillingham Boulevard between the Waiakamilo Road and Kohou Street Intersections. T-057 was located immediately adjacent to the Kapālama Shopping Center and across from the Kapālama Satellite City Hall. Kapālama Stream was located approximately 120.0 m to the southeast of T-057. Nearby utilities included a sewer line approximately 3.0 m south (*makai*,) a waterline 4 m north (*mauka*), and an electric utility 5 m southeast of T-057. The surrounding surface was level and gently sloped to the east.

Summary of Background Research and Land Use: Brown's 1883 map of Kalihi and Kapālama showed T-057 within Konohiki lands approximately 20 m *makai* of LCA 1222:1 and LCA: 1222:2. LCA 1222: 1 and LCA 1222:2 contained one house lot, five *lo'i,* and two coconut trees. Many other small LCAs dot the area around T-057. An *'auwai* (irrigation stream) was approximately 77 m southeast of T-057. Monsarrat's 1897 map of Honolulu had T-057 within possible rice plantations. By 1919, the areas to the north and west of T-057 were dramatically altered with roads and residential developments, according to the 1919 U.S. Army War Department Fire Control map. The 1933 U.S. Army War Department Fire Control map and a 1943 U.S. Army War Department map placed T-057 in the midst of a street grid system near the road alignment for Dillingham Boulevard. T-057 was 70 m southeast of an unnamed stream and 238 m northwest of the Niuhelewai Stream. While both streams were present from 1919 to 1933, by 1943 the unnamed stream was gone and the Niuehelewai Stream appeared channelized (1919, 1933, and 1943 U.S. Army War Department map). The 1953 U.S. Army Mapping Service map showed the Niuhelewai Stream directed into Kapālama Basin. By 1953, T-057 was within the completed Dillingham Boulevard and the surrounding areas were established as part of the formal Kalihi and Kapālama area.

Few archaeological studies were conducted in the West Kapālama Zone near T-056. Tulchin and Hammatt (2013, in progress) conducted an archaeological inventory survey 63.0 m to the northwest of T-056. Pammer and Monahan (2011) completed an archaeological literature review and field inspection with limited subsurface testing for the Kapālama Shopping Center Redevelopment Project located 12.0 m north of T-056. No historic properties were identified, but *lo'i* sediments were observed beneath fill layers.

Documentation Limitations: T-057 was excavated to beneath the water table at 1.62 mbs, to a depth of 1.66 mbs. Excavation concluded at 1.66 mbs due to possible contamination (evidenced by a strong petroleum odor) and unstable sidewalls due to the removal of boulders.

Stratigraphic Summary: The stratigraphy of T-057 consisted of fill strata overlying natural sediment to the base of excavation. Observed strata included asphalt (Ia), extremely gravelly loam base course (Ib), extremely gravelly sand fill (Ic), sandy clay loam fill (Id), sandy clay loam fill (Ie), natural silty clay wetland sediment (II). Stratum II had possible petroleum contamination from an unknown source. The stratigraphy conformed to the USDA soil survey designation of Fill land (FL).

Artifact Discussion: See sample results below.

Feature Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were observed.

Sample Results: One bulk sample was collected from Stratum II at 1.62 mbs (0.5 L). The sample was removed from the backhoe bucket and is not depicted on the profile. The bulk sediment sample was wet screened. The bulk sediment sample contained small charcoal pieces (1.3 g), naturally-deposited marine shell (1.3 g), naturally-deposited terrestrial snail shell and matrix (139.6 g), wood pieces (90.2 g), *kukui* nut shell (1.6 g), rusty metal fragments (18 g), and coral gravels. Sample analysis indicated a mixed origin of Stratum II with sparse historic cultural material.

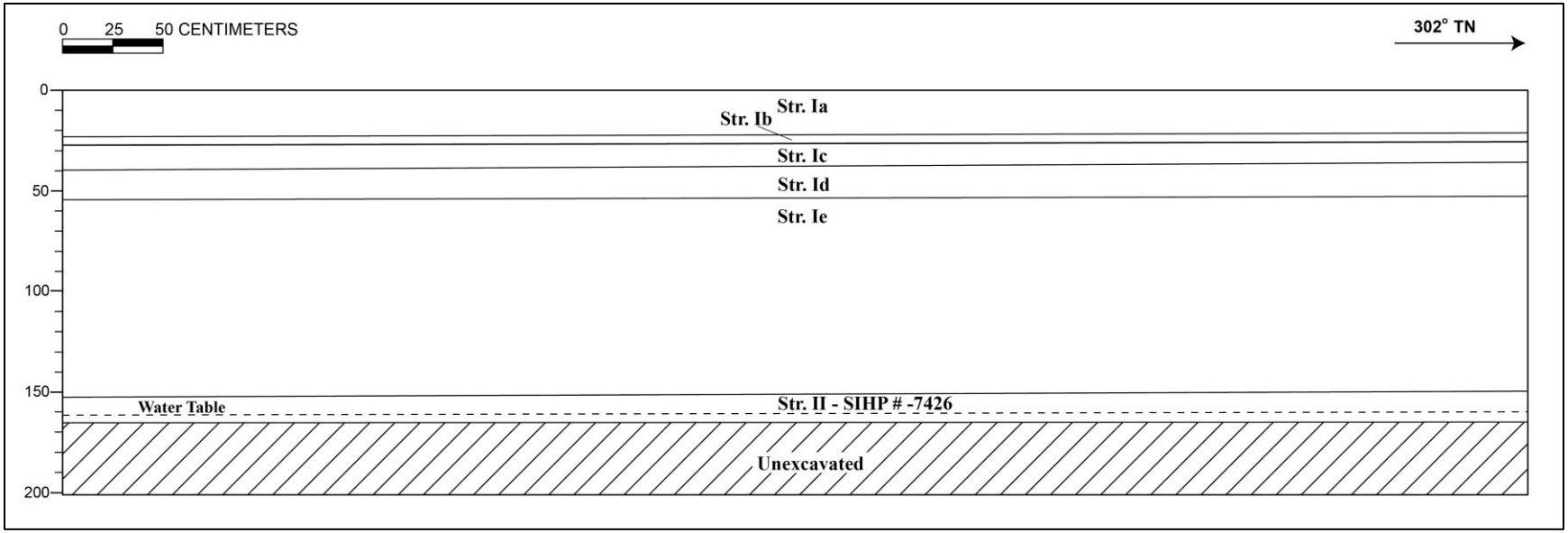
GPR Discussion: A review of amplitude slice maps indicated no linear features which might have indicated the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.25 mbs.

GPR depth profiles for T-057 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity which occurred around 0.25 mbs. No utilities were observed in the profile. The maximum depth of clean signal return was approximately 1.0 mbs.

Summary: T-057 was excavated to beneath the water table at 1.62 mbs to a depth of 1.66 mbs. The stratigraphy of T-057 consisted of fill strata (Ia to Ie) overlying natural sediment (II) to the base of excavation. The stratigraphy conformed to the USDA soil survey designation of Fill land (FL). Sample analysis indicated a mixed origin of Stratum II with sparse historic cultural material. Stratum II of T-057 is designated a component of SIHP #50-80-14-7426 (see Volume I).

T-057 general location, view to northwest

T-057 southwest wall profile



T-057 southwest wall profile

T-057 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-22	Asphalt
Ib	22-30	Fill; 10 YR 3/2 (very dark grayish brown); extremely gravelly loam; structureless, single-grain; moist, loose consistency; non-plastic; terrigenous origin; very abrupt, smooth lower boundary; gravel base course
Ic	30-40	Fill; 10 YR 5/1 (gray); extremely gravelly sand; structureless, massive; moist, indurated consistency; non-plastic; terrigenous origin; very abrupt, smooth lower boundary
Id	40-55	Fill; 10 YR 4/3 (brown); sandy clay loam; weak, fine, crumb structure; moist, very friable consistency; slightly plastic; terrigenous origin; very abrupt, smooth lower boundary; few, fine roots
Ie	55-152	Fill; 10 YR 4/2 (dark grayish brown); very stony silty clay; weak, very fine, blocky structure; moist, very firm consistency; plastic; terrigenous origin; abrupt, smooth lower boundary; few, fine to medium roots; contained many small to medium angular boulders, extremely clay rich; alluvium and broken rocks used as fill, ammonia smell
II	152-166	Natural; GLEY 2 2.5/10B (bluish black); silty clay; strong, fine, blocky structure; wet, sticky consistency; plastic; mixed origin; lower boundary not visible; natural wetland sediment with snail inclusions; some petroleum contamination; component of SIHP #50-80-14-7426.

3.11 Test Excavation 58 (T-058)

***Ahupua'a*:**	Kapālama
LCA:	N/A
TMK #:	1-5-020 [Plat]
Elevation Above Sea Level:	1.5 m
UTM:	616774.12 mE, 2358259.42 mN
Max Length / Width / Depth:	6.7 m / 0.62 m / 1.64 mbs
Orientation:	142 / 322º TN
Targeted Project Component:	Utility relocation
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 58 (T-058) was located in the right lane of the eastbound side of Dillingham Boulevard. T-058 was in front of the Kapālama Satellite City Hall and across from the Kapālama Shopping Center. T-058 was located on property owned by the City and County of Honolulu. T-058 was approximately 2.5 m northeast (*mauka*) of two storm drains and 2.2 m southwest (*makai*) of a water line and electric line.

Summary of Background Research and Land Use: Brown's 1883 map of Kalihi and Kapālama depicted T-058 within Konohiki lands 42 m northwest of LCA 8856: 2 and 27 m south of LCA 1222 *'apana* 1 and 2. LCA 8856:2 was awarded to Kalanui and included one house lot and three *lo'i*. LCA 1222 was awarded to Alua and contained one house lot, five *lo'i* and two coconut trees. Many other small LCAs are present in the vicinity of T-058. An *'auwai* (irrigation channel) was located approximately 40 m southeast of T-058. Monsarrat's 1897 map of Honolulu depicted T-058 within rice fields. The 1919 U.S. Army War Department Fire Control map depicts expansive infrastructure and residential development in the area surrounding T-058. The 1933 and 1943 U.S. Army War Department maps also documented increased development. By 1953, T-058 was located within the Dillingham Boulevard right-of-way.

Few archaeological studies were conducted in the West Kapālama Zone near T-058. Tulchin and Hammatt (2013-in progress) conducted an archaeological inventory survey 95 m to the northwest of T-058. Pammer and Monahan (2011) completed an archaeological literature review and field inspection with limited subsurface testing for the Kapālama Shopping Center Redevelopment Project located 22 m north of T-058. No historic properties were identified, but *lo'i* sediments were observed beneath fill layers.

Documentation Limitations: T-058 was excavated to beneath the water table at 1.60 mbs, to a depth of 1.64 mbs. A utility line and unstable sidewalls within the northwest end of T-058 limited the excavation.

Stratigraphic Summary: The stratigraphy of T-058 consisted of fill strata overlying natural sediment to the base of excavation. Observed strata included asphalt (Ia), extremely stony loamy sand fill (Ib), gravelly sandy clay fill (Ic), gravelly sandy clay fill (Id), and extremely gravelly sand fill (Ie), natural loamy clay marsh/wetlands sediment (II). Stratum II was highly organic

with peaty material present. The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL).

Artifact Discussion: No artifacts were observed.

Feature Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were observed.

Sample Results: Two bulk sediment samples collected from the excavation floor of Stratum II between 1.68-1.78 mbs (4 L) and 1.68-1.85 (4 L). Both samples were wet-screened. The sample collected from 1.68-1.78 mbs contained charcoal (0.8 g), terrestrial snail shells (48.7 g), naturally-deposited marine shell (5.9 g), wood fragments (2.0 g), and a *kukui* nut shell fragment (0.1 g). The sample from 1.68-1.85 mbs contained terrestrial snail shells (29.9 g), naturally-deposited marine shell (7.5 g), and wood or bark fragments (2.3 g). The results of sample analysis documented the mixed origin of Stratum II, which appeared to be consistent with a natural wetland environment.

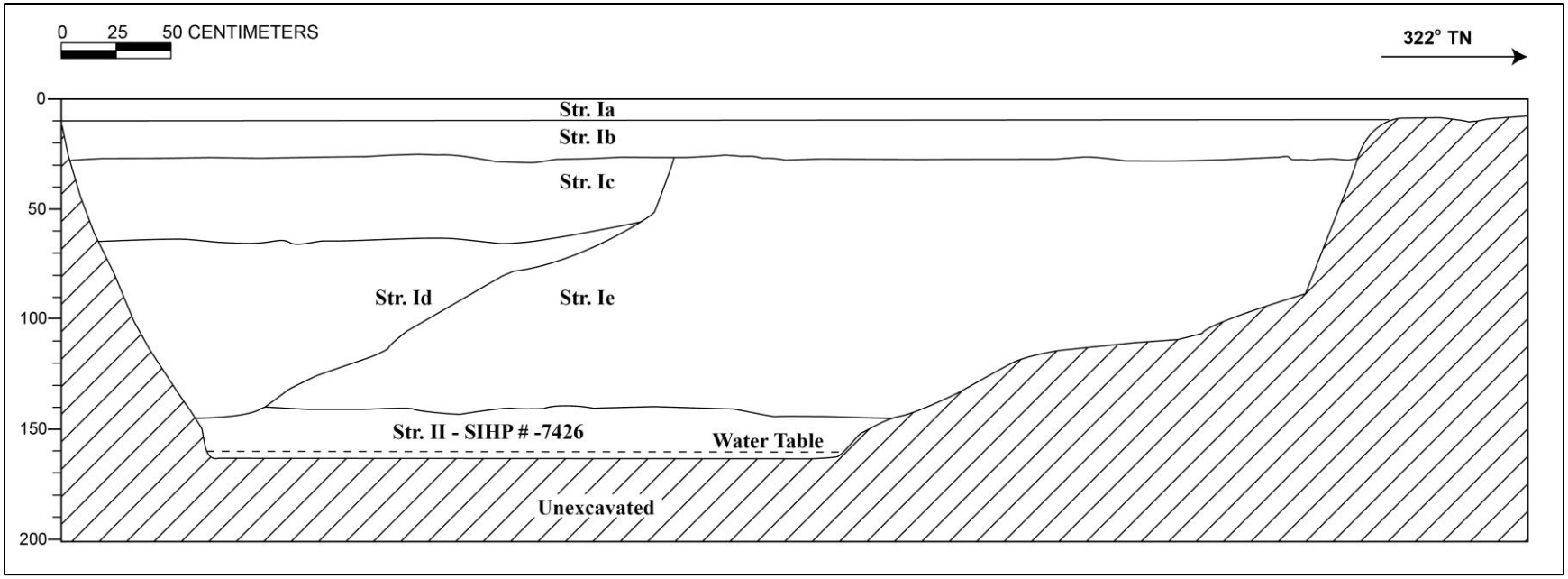
GPR Discussion: A review of amplitude slice maps indicated a linear feature which corresponded to the utility encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreased with depth except for the utility. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.25 mbs.

GPR depth profiles for T-058 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity which occurred around 0.20 mbs and again around 0.60 mbs. An anomaly was observed in the profile and corresponded to the utility that was encountered during excavation. The maximum depth of clean signal return was approximately 1.0 mbs.

Summary: T-058 was excavated to beneath the water table at 1.60 mbs, to a depth of 1.64 mbs. The stratigraphy consisted of fill strata (Ia-Ie) overlying natural wetland sediment (II) to the base of excavation. The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). The results of sample analysis documented the mixed origin of Stratum II, which appeared to be consistent with a natural wetland environment. Stratum II of T-058 is designated as a component of SIHP #50-80-14-7426 (see Volume I).

T-058 general location, view to northwest

T-058 southwest wall profile



T-058 southwest wall profile

T-058 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-11	Asphalt; road surface
Ib	10-29	Fill; 10 YR 4/1 (dark gray); extremely stony loamy sand; structureless, single-grain; moist, loose consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; imported fill
Ic	25-66	Fill; 10 YR 5/2 (grayish brown); gravelly sandy clay; moderate, medium, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, broken/discontinuous lower boundary; imported fill with crushed coral inclusions
Id	63-145	Fill; 5 YR 3/3 (dark reddish brown); gravelly sandy clay; structureless, massive; moist, friable consistency; plastic; terrigenous origin; abrupt, broken/discontinuous lower boundary; mica gravels in clay, likely a locally procured fill from river/stream
Ie	25-145	Fill; 5 YR 3/3 (dark reddish brown); extremely gravelly sand; weak, fine, crumb structure; moist, friable consistency; non-plastic; terrigenous origin; abrupt, broken/discontinuous lower boundary; likely a locally procured fill from river/stream
II	139-164	Natural; 10 YR 3/1 (very dark gray); loamy clay; structureless, massive; wet, very sticky consistency; very plastic; mixed origin; lower boundary not visible; natural sediment, highly organic, peaty, consistent with marsh/wetlands; component of SIHP #50-80-14-7426.

3.12 Test Excavation 59 (T-059)

***Ahupua'a*:**	Kapālama
LCA:	N/A
TMK #:	1-5-020 [Plat]
Elevation Above Sea Level:	1.61 m
UTM:	616801.65 mE, 2358254.29 mN
Max Length/Width/Depth:	7.35 m / 0.74 m / 1.75 mbs
Orientation:	300 / 120º TN
Targeted Project Component:	Utility relocation (Electric Manhole)
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 59 (T-059) was located approximately 45 m northwest of the Dillingham Boulevard and Kohou Street intersection, in the far left lane of the westbound lanes of Dillingham Boulevard, and 62 m northwest of Kapālama Stream. Utilities located near T-059 included a sewer line 2.7 m south, a water line 4.7 m south, and another water line 5 m south. The surrounding surface was level and gently sloped to the east.

Summary of Background Research and Land Use: Brown's 1883 map of Kalihi and Kapālama depicted T-059 within Konohiki lands 25 m northwest of LCA 8856: 1, and 31 m south of LCA 1222 *'apana* 1 and 2. LCA 8856:2 was awarded to Kalanui and included one house lot and three *lo'i*. LCA 1222 was awarded to Alua and contained one house lot, five *lo'i* and two coconut trees. Many other small LCAs are present in the vicinity of T-059. An *'auwai* (irrigation channel) was located approximately 40 m southeast of T-059. M.D. Monsarrat's 1897 map of Honolulu depicted T-059 within rice fields. The 1919 U.S. Army War Department Fire Control map depicts expansive infrastructure and residential development in the area of T-059. The 1933 and 1943 U.S. Army War Department maps also documented increased development. By 1953, T-059 was located within the Dillingham Boulevard right-of-way.

Few archaeological studies were conducted in the East Kapālama Zone near T-059. Tulchin and Hammatt (2013-in progress) conducted an archaeological inventory survey 95 m to the northwest of T-059. Pammer and Monahan (2011) completed an archaeological literature review and field inspection with limited subsurface testing for the Kapālama Shopping Center Redevelopment Project located 22.0 m north of T-059. No historic properties were identified, but *lo'i* sediments were observed beneath fill layers.

Documentation Limitations: T-059 was excavated to beneath the water table at 1.51 mbs, to a depth of 1.75 mbs. The northwest end of T-059 was not fully excavated to avoid disturbing a large boulder and destabilizing the surrounding walls.

Stratigraphic Summary: The stratigraphy of T-059 consisted of fill strata overlying natural sediment to the base of excavation. Observed strata included asphalt (Ia), extremely gravelly loam base course (Ib), extremely gravelly sand (CLSM) fill (Ic), very gravelly sandy loam fill (Id), extremely gravelly, cobbly loamy sand fill (Ie), and natural silty clay wetland sediment (II).

Stratum II had petroleum contamination from an unknown source. The stratigraphy conformed to the USDA soil survey designation of Fill land (FL).

Artifact Discussion: No artifacts were observed.

Feature Discussion: No features were observed.

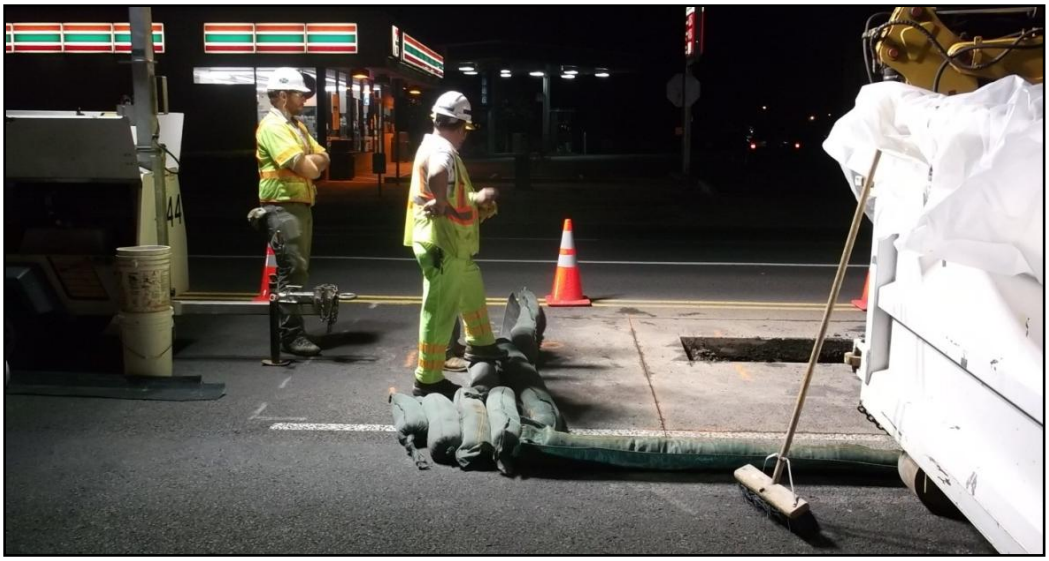
Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were observed.

Sample Results: One bulk sediment sample was collected from Stratum II between 1.65-1.75 mbs (5.0 L). The sample was removed from the backhoe bucket and is therefore not depicted on the profile. The bulk sediment sample was wet screened. The bulk sediment sample contained charcoal (0.1 g), terrestrial snail shells (84 g), naturally-occurring, water-rounded Tellinidae shell fragments (2.7 g) and coral and basalt gravel. The results of sample analysis supported the identification of Stratum II as a natural wetland deposit.

GPR Discussion: A review of amplitude slice maps indicated no linear features which might have indicated the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.25 mbs.

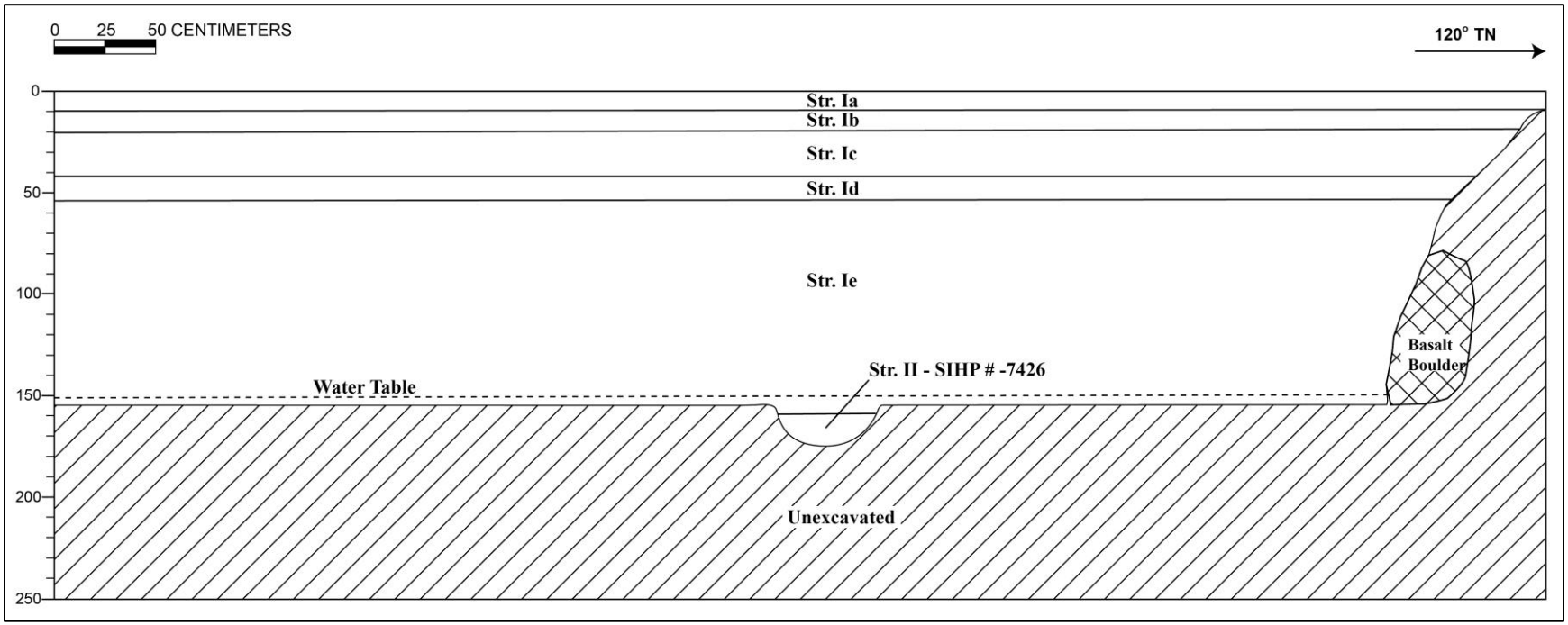
GPR depth profiles for T-059 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity which occurred around 0.25 mbs and again around 0.50 mbs. No utilities were observed in the profile. The maximum depth of clean signal return was approximately 1.2 mbs.

Summary: T-059 was excavated to beneath the water table at 1.51 mbs, to a depth of 1.75 mbs. The stratigraphy of T-059 consisted of fill strata (Ia-Ie) overlying natural sediment (II) to the base of excavation. The stratigraphy conformed to the USDA soil survey designation of Fill land (FL). The results of sample analysis supported the identification of Stratum II as a natural wetland deposit. Stratum II of T-059 is designated as a component of SIHP #50-80-14-7426 (see Volume I).



T-059 general location, view to southwest

T-059 southwest wall profile (opposite sidewall from profile wall)



T-059 northeast wall profile

T-059 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-10	Asphalt
Ib	10-21	Fill; 10 YR 3/2 (very dark grayish brown); extremely gravelly loam; structureless, single-grain; moist, loose consistency; non-plastic; terrigenous origin; very abrupt, smooth lower boundary; gravel base course
Ic	21-43	Fill; 10 YR 4/1 (dark gray); extremely gravelly sand (CLSM); structureless, massive; moist, indurated consistency; very abrupt smooth boundary
Id	43-55	Fill; 10 YR 3/3 (dark brown); very gravelly sandy loam; weak, fine, crumb structure; moist, very friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; some coral cobble inclusions
Ie	55-165	Fill; 10 YR 3/2 (very dark grayish brown); extremely gravelly, cobbly loamy sand; structureless, single grain; moist, loose consistency; non-plastic; terrigenous origin; lower boundary not visible; ~90% gravel and cobbles; ~80% water rounded and 20% sub-angular
II	160-175	Natural; GLEY 2 2.5/10B (bluish black); silty clay; structureless, massive; wet, very sticky consistency; very plastic; terrigenous origin; lower boundary not visible; contained fresh water snails, natural wetland sediment with some petroleum contamination; component of SIHP #50-80-14-7426.

3.13 Test Excavation 60 (T-060)

***Ahupua'a*:**	Kapālama
LCA:	N/A
TMK #:	1-5-020: 003
Elevation Above Sea Level:	1.8 m
UTM:	616897 mE, 2358158 mN
Max Length/Width/Depth:	7.63 m / 0.75 m / 2.2 mbs
Orientation:	123 / 303º TN
Targeted Project Component:	Station Building
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 60 (T-060) was within a privately owned parking lot of a small strip mall located on the south side of Dillingham Boulevard near the Kokea Street intersection. T-060 was near the H&R Block storefront and 40 m southeast of Kapālama Stream. The only utilities indicated were two sewer lines 2.6 m and 5.3 m east of T-060. The location was within private property. The original location of T-060 was offset by 5 m to the southeast.

Summary of Background Research and Land Use: Brown's 1885 map of Kalihi and Kapālama showed T-060 was part of Konohiki lands in Grant 10754 awarded to A.L. Castle and Ethelinda S. Castle. T-060 was adjacent to LCA 1034 and 8400:3 which awarded to Kuhelelei and LCA 275 B:2 awarded to Henry Zupplein. LCA 1034 and 8400:3 contained three *lo'i* while LCA 275 B:2 included 19 or more *taro* patches. At this time T-060 was 122 m southeast of an *'auwai* (irrigation stream) and appeared to be directly on the western bank of Niuhelewai Stream. Monsarrat's 1897 map of Honolulu indicated T-060 was within an area of a large rice field. By 1919 T-060 was 34 m northwest of Niuhelewai Stream and the surrounding area was dramatically altered with roads and residential developments, according to the 1919 Army U.S. Army War Department map. The 1933 and the 1943 U.S. Army War Department maps place T-060 within a developing street grid system. In 1943 the Niuhelewai Stream was channelized and the 1953 U.S. Army Mapping Service map showed the Niuhelewai Stream changed to Kapālama Stream and directed into Kapālama Basin. By 1953, T-060 was shown to be in a building footprint *makai* of Dillingham Boulevard.

Several previous archaeological studies were within the vicinity of T-060. Approximately100 m northwest of T-060, Pammer and Monahan (2011) performed an archaeological literature review and field inspection with limited subsurface testing for the Kapālama Shopping Center Redevelopment Project. No historic properties were identified but *lo'i* sediments were observed beneath fill layers. 136 m northeast of T-060 O'Hare et al. (2010) performed an archaeological literature review and field inspection for the Honolulu Community College Advanced Technology Training Center Project. T-060 was 20 m south of the archaeological monitoring conducted for a section of Dillingham Boulevard (Medina et al. 2012, in progress). T-060 was also within the Kapālama ethnohistoric study area conducted by Uyeoka et al. (2009).

Documentation Limitations: T-060 was excavated to beneath the water table at 1.96 mbs, to a depth of 2.2 mbs. There were no specific factors that limited documentation of T-060.

Stratigraphic Summary: The stratigraphy of T-060 consisted of fill material overlying the natural sediment deposit at 1.02 mbs. The stratigraphy included asphalt (Ia), extremely gravelly sand crushed coral fill (Ib), loamy clay fill (Ic), extremely gravelly sand (Id), loamy sand fill (Ie), crushed coral sand (If), natural sand (IIa), natural silty clay (IIb), and coral shelf (III). The stratigraphy conformed to the USDA soil survey designation of Fill land (FL). Stratum IIa was previously disturbed natural sediment within the upper boundary Stratum IIb.

Artifacts Discussion: One complete glass medicine bottle (Acc. #060-A-1) was collected from Stratum IIb, the former subsurface wetlands agricultural sediment deposit designated as SIHP #50-80-14-7426. This medicine bottle was for a drug store in Manila, Philippines, that was operational in the 1930s, and possibly earlier (see following photograph).

Feature Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were observed.

Sample Results: A total of three bulk sediment sampled were collected from T-060 Stratum IIb and III as shown on the profile. The bulk samples were wet-screened. The sample collected from Stratum IIb at 1.7 mbs (1 L) contained 5.0 g of naturally occurring shell material and snails, and one water rounded coral gravel (23.7 g). The sample from Stratum IIb at 1.98 mbs (1 L) contained charcoal (0.1 g), non-midden related micro gastropods (2.7 g), fish remains (0.1 g) and historic debris of metal pieces (79.7 g), and one glass shard (0.1 g). The sample collected from Stratum III at 2.34 mbs (1 L) contained non-midden related shell and gastropods (219.4 g).The results of sample analysis indicated Stratum IIb was former wetlands/agricultural sediment. The historic debris within the naturally deposited sediment indicated the upper boundary of Stratum IIb was previously disturbed at the interface with Stratum IIa.

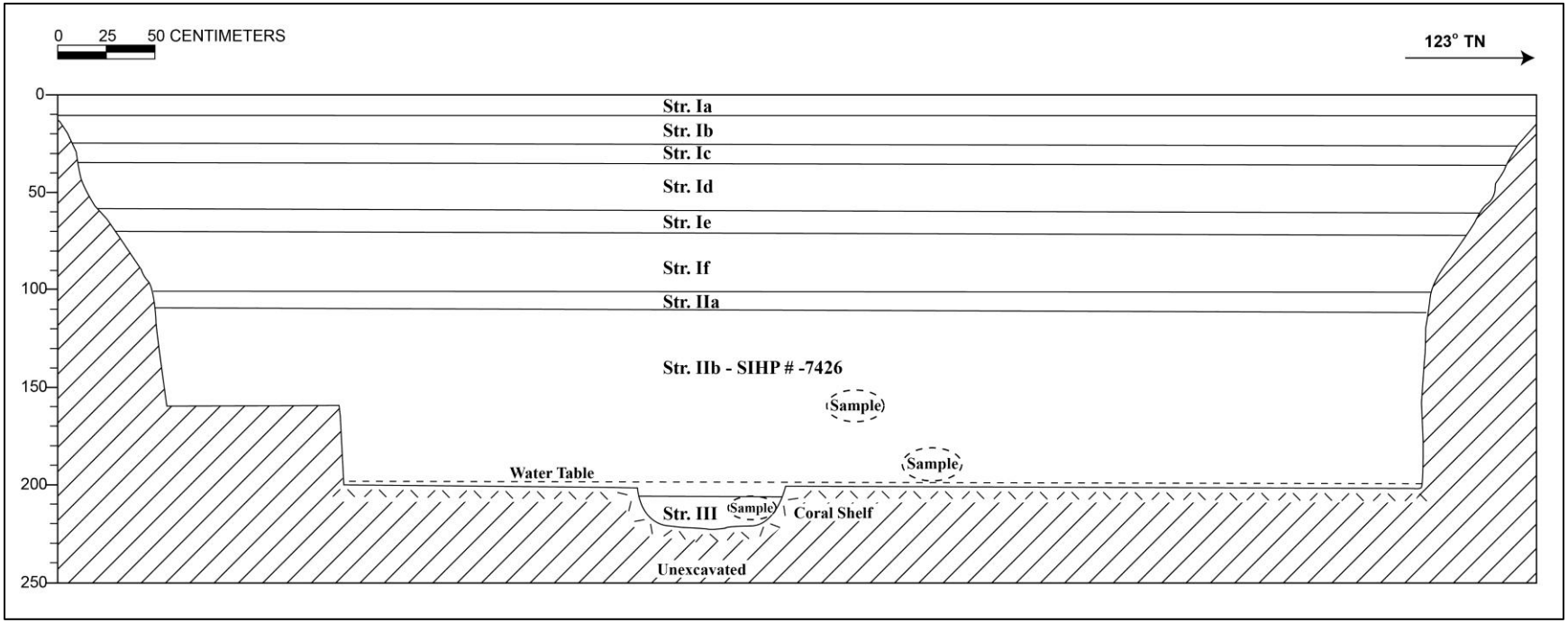
GPR Discussion: A review of amplitude slice maps indicated no linear features which might have indicated the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.50 mbs.

GPR depth profiles for T-060 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity which occurred around 0.15 mbs. No utilities were observed in the profile. The maximum depth of clean signal return was approximately 0.90 mbs.

Summary: T-060 was excavated to beneath the water table at 1.96 mbs, to a depth of 2.2 mbs. The stratigraphy consisted of fill material (Ia-If) overlying the natural sediment deposit at 1.02 mbs (IIa-III). The observed stratigraphy conformed to the USDA Fill land (FL) soil designation for the area. The historic debris within the naturally deposited sediment indicated the upper boundary of Stratum IIb was previously disturbed at the interface with Stratum IIa. The results of sample analysis indicated Stratum IIb was a former wetland sediment. Stratum IIb is considered to be a component of SIHP #50-80-14-7426 (see Volume I).

T-060 pre-excavation, view to south

T-060 southwest wall profile



T-060 southwest wall profile

T-060 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-11	Asphalt
Ib	11-25	Fill; 10 YR 8/3 (very pale brown); extremely gravelly sand; structureless, single-grain; dry, loose consistency; marine origin; abrupt, wavy lower boundary; crushed coral fill
Ic	25-35	Fill; 10 YR 4/4 (dark yellowish brown); loamy clay; structureless, single-grain; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; fill deposit
Id	35-59	Fill; 10 YR 5/1 (gray); extremely gravelly sand; structureless, single-grain; moist, loose consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; gravel base course
Ie	59-70	Fill; 2.5 YR 3/3 (dark reddish brown); loamy sand; structureless, single-grain; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; fill deposit
If	70-102	Fill; 2.5 Y 8/3 (pale yellow); medium to fine grain sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; crushed coral sand fill
IIa	102-110	Natural; 2.5 Y 7/2 (light gray) medium to fine grain sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; previously disturbed natural marine sediment.
IIb	110-205	Natural, former A-horizon; 5 Y 2.1/1 (black) silty clay; structureless, single-grain; moist, friable consistency; plastic; terrigenous origin; abrupt, smooth lower boundary; contains rusted ferrous material, sheets and pipe, one glass medicine bottle, and a peaty material located within upper boundary, at 172 cmbs; natural sediment, previously disturbed upper boundary; component of SIHP #50-80-14-7426.
III	205-220	Coral shelf

T-060 complete glass medicine bottle (Acc. #060-A-1), from Stratum IIb

3.14 Test Excavation 61 (T-061)

***Ahupua'a*:**	Kapālama
LCA:	N/A
TMK #:	1-5-020:003
Elevation Above Sea Level:	1.7 m
UTM:	616901.37 mE, 2358164.27 mN
Max Length/Width/Depth:	6.75 m / 0.80 m / 2.05 mbs
Orientation:	295 / 115º TN
Targeted Project Component:	Station Building
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 61 (T-061) was within the parking lot of a small strip mall located on the south side of Dillingham Boulevard near the Kokea Street intersection (22 m to the northwest). T-061 was near the H&R Block storefront and approximately 40 m southeast of Kapālama Stream. The only utilities indicated were two sewer lines 6 m and 8.8 m east of T-061. The location was within private property owned by Bishop Estate. The original location of T-061 was offset by 1 m to the north.

Summary of Background Research and Land Use: Brown's 1885 map of Kalihi and Kapālama showed T-061 was part of Konohiki lands in Land Commission Grant 10754 awarded to A.L. Castle and Ethelinda S. Castle. T-061 was adjacent to LCA 1034 and 8400:3, which was awarded to Kuhelelei and LCA 275 B:2 awarded to Henry Zupplein. LCA 1034 and 8400:3 contained three *lo'i* while LCA 275 B:2 included 19 or more *taro* patches. At this time, T-061 was 115 m southeast of an *'auwai* (irrigation ditch) and appeared to be directly on the western bank of Niuhelewai Stream. Monsarrat's 1897 map of Honolulu indicated T-061 was within an area of a large rice field. By 1919, T-061 was 40 m northwest of Niuhelewai Stream and the surrounding area was dramatically altered with roads and residential developments, according to the 1919 U.S. Army War Department Fire Control map. The 1933 U.S. Army War Department Fire Control map and a 1943 U.S. Army War Department map placed T-061 within a developing street grid system. By 1943, the Niuhelewai Stream was channelized and the 1953 U.S. Army Mapping Service map showed the Niuhelewai Stream changed to Kapālama Stream and directed into Kapālama Basin. T-061 was shown to be in a building footprint south of Dillingham Boulevard.

Several previous archaeological studies were within the vicinity of T-061. Approximately 95 m northwest of T-061, Pammer and Monahan (2011) performed an archaeological literature review and field inspection with limited subsurface testing for the Kapālama Shopping Center re-development project. No historic properties were identified but *lo'i* sediments were observed beneath fill layers. 125 m northeast of T-061 O'Hare et al. (2010) performed an archaeological literature review and field inspection for the Honolulu Community College Advanced Technology Training Center Project. T-061 was 11 m south of the archaeological monitoring

conducted for a section of Dillingham Boulevard (Medina et al. 2013, in progress). T-061 was also within an ethnohistoric study area conducted by Uyeoka et al. (2009).

Documentation Limitations: T-061 was excavated to a depth of 2.05 mbs, and beneath the water table at 1.85 mbs. Excavation documentation was limited by destabilized sidewalls.

Stratigraphic Summary: The stratigraphy of T-061 consisted predominately of fill strata overlying natural sediment transition to the base of excavation. Observed strata included asphalt (Ia), extremely gravelly sand base course (Ib), imported cinder fill (Ic), compacted clay fill (Id), very gravelly sandy clay (Ie), crushed coral (If), and very gravelly sandy clay (Ig), overlying natural organically enriched clay (II) to the base of excavation. The stratigraphy generally conformed to the USDA) soil designation of Fill land (FL).

Artifacts Discussion: Two (2) historic artifacts were collected from T-061, one clear glass milk bottle (Acc. #60-A-1, see following photograph) from 0.65-1.30 mbs, Stratum If, and one clear glass milk bottle (Acc. #60-A-2, see following photograph) from 1.10-1.70 mbs, Stratum Ig. Both bottles were for made for O’ahu dairy companies. One was made in 1936 or 1946, and the other also dates to the 1930s-1940s. Artifacts collected from Strata If (sand fill) and Ig (sandy clay fill) indicated that both strata post-date the early twentieth century.

Features Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were observed.

Sample Results: One bulk sediment sample was collected from Stratum II between 1.4 and 2.05 mbs. The sediment sample was wet-screened. The bulk sediment sample (4 L) collected from Stratum II contained non-midden marine shell including Hipponicidae *Hipponix sp.*, and terrestrial snails including round flat snail, and small to medium snails. The results of sample analysis indicated Stratum II was part of a former wetlands/agricultural sediment.

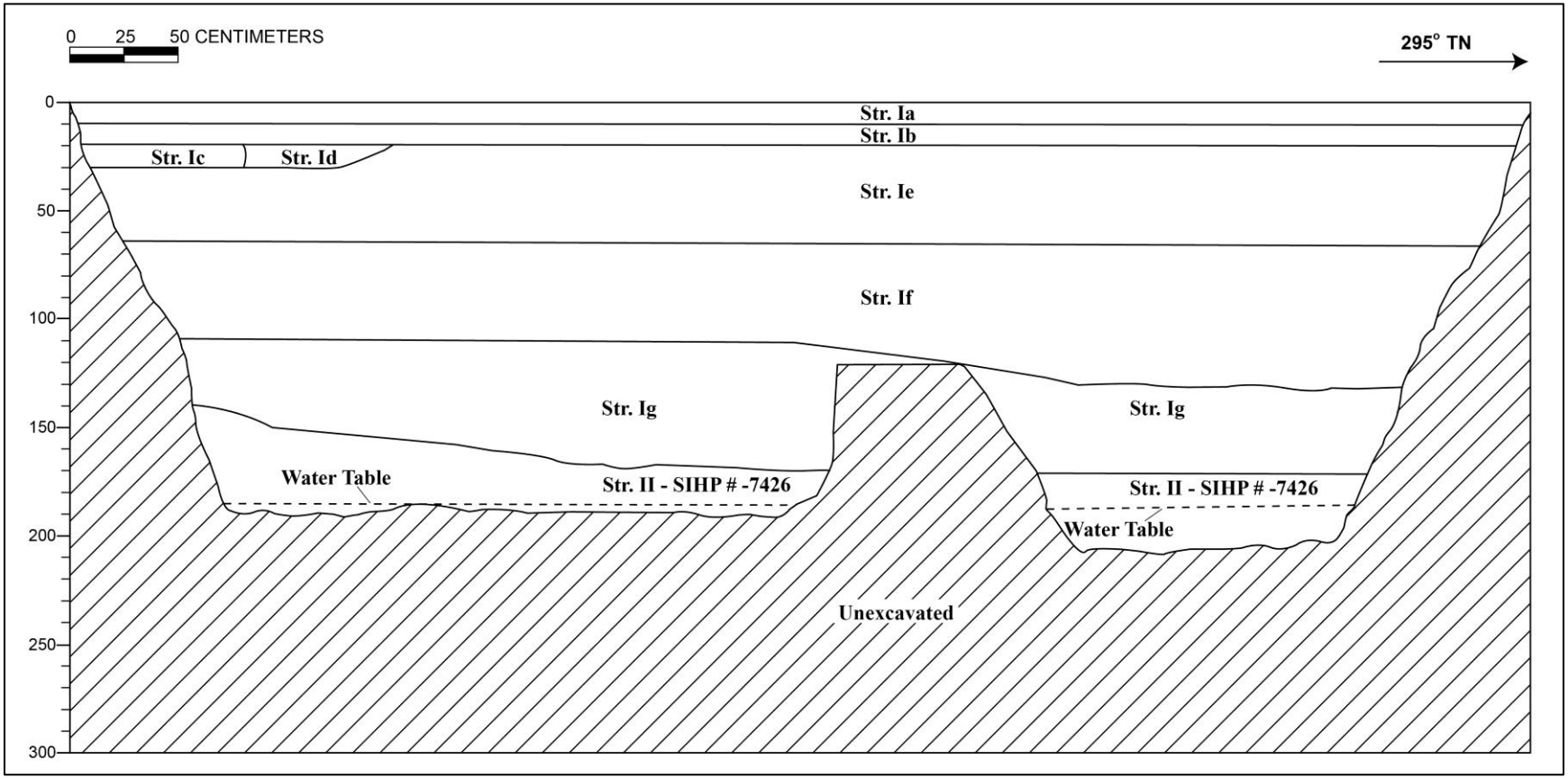
GPR Discussion: A review of amplitude slice maps indicated no linear features although a pipe was encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.50 mbs.

GPR depth profiles for T-061 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity which occurred around 0.20 mbs. No utilities were observed in the profile although a pipe was encountered during excavation. The maximum depth of clean signal return was approximately 0.75 mbs.

Summary: T-061 was excavated to a depth of 2.05 mbs, and below the water table at 1.85 mbs. The stratigraphy of T-061 consisted predominately of fill strata (Ia-Ig) overlying natural sediment (II) transition to the base of excavation. Artifacts collected from Strata If (sand fill) and Ig (sandy clay fill) indicated that both strata post-date the early twentieth century. The results of sample analysis indicated Stratum II was part of former wetlands/agricultural sediments that dominated the landscape surrounding T-061 until the early twentieth century. Stratum II is considered a component of SIHP #50-80-14-7426 (see Volume I).

T-061 general location, view to south

T-061 southwest wall profile, view to south



T-061 southwest wall profile

T-061 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-10	Asphalt
Ib	10-20	Fill; 10 YR 3/12 (very dark grayish brown) extremely gravelly sand; weak, coarse, crumb structure; moist, friable consistency; non-plastic; mixed origin; clear, smooth lower boundary; basalt gravel base course fill with sand matrix
Ic	20-30	Fill; 10 YR 2/1 (black) coarse sand; structureless, single-grain; dry, loose consistency; non-plastic; terrigenous origin; abrupt, broken/discontinuous lower boundary; imported cinder fill
Id	20-30	Fill; 10 YR 3/2 (very dark grayish brown) clay; structureless, massive; moist, extremely firm consistency; very plastic; terrigenous origin; clear, broken/discontinuous lower boundary; compacted clay fill lens
Ie	20-65	Fill; 5 YR 3/3 (dark reddish brown) very gravelly sandy clay; structureless, massive; moist, firm consistency; plastic; mixed origin; very abrupt, smooth, broken/discontinuous lower boundary; mixed fill contains 50% angular basalt gravel, less than 10% marine sand in clay matrix
If	65-130	Fill; 10 YR 7/2 (light gray) very gravelly medium-coarse sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; contained 1 whole clear glass milk bottle; sand matrix with 40-60% coral gravel to cobble fill
Ig	110-170	Fill; GLEY 2.5/10 Y (greenish black) very gravelly clay; structureless, massive; wet, very sticky consistency; plastic; mixed origin; clear, smooth lower boundary; contained broken metal pipe, metal fragments 1 whole clear glass milk bottle; locally procured fill with several large basalt boulders, 40% basalt and coral gravel
II	140-205	Natural; GLEY 2.5/N (black) clay; structureless, massive; wet, sticky consistency; slightly plastic; mixed origin; lower boundary not visible; common, fine roots; highly organic clay matrix with roots/rootlets, terrestrial snail shell, sample collected; component of SIHP #50-80-14-7426.

T-061 milk glass bottle (Acc. #061-A-1), from Stratum If

T-061 milk glass bottle (Acc. #061-A-2), from Stratum Ig (This bottle was from the Honolulu Dairymen’s Association and the glass bottle was made in 1936 or 1946.)

3.15 Test Excavation 62 (T-062)

***Ahupua'a*:**	Kapālama
LCA:	N/A
TMK #:	1-5-017:006
Elevation Above Sea Level:	1.7 m
UTM:	616948 mE, 2358216 mN
Max Length/Width/Depth:	5.2 m, 1 m, 2.05 mbs
Orientation:	58 / 238º TN
Targeted Project Component:	Station Building
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 62 (T-062) was located within Honolulu Community College (privately owned property of Honolulu Community College) on the north side of Dillingham Boulevard and the Kokea Street intersection (42m southwest). T-062 was 27.0 m east from Kapālama Stream. A water line was approximately 9.0 m northwest of T-062. T-062 was widened by 0.2 m along the southeastern side and 0.1 m on the northwestern side. The original location of T-062 was offset by 3.0 m to the northeast.

Summary of Background Research and Land Use: Brown's 1885 map of Kalihi and Kapālama showed T-062 within Konohiki lands part of Grant 10754 to A.L. Castle and Ethelinda S. Castle. At this time, T-062 was 85 m southeast of an *'auwai* (irrigation stream) and 25 m north of Niuhelewai Stream. Monsarrat's 1897 map of Honolulu indicated T-062 was within a large rice plantation. By 1919 the surrounding area was dramatically altered with the agricultural lands converted to roads and residential developments, according to the 1919 Army U.S. Army War Department map. The 1933 and 1943 U.S. Army War Department maps place T-062 within a developing street grid system. Urban development continued through the 1950s and the Niuhelewai Stream was changed to Kapālama Stream and channeled into Kapālama Basin, according to the 1953 U.S. Army Mapping Service map.

Several previous archaeological studies were within the vicinity of T-062. Pammer and Monahan (2011) performed an archaeological literature review and field inspection with limited subsurface testing 81 m northwest of T-062 for the Kapālama Shopping Center re-development project. No historic properties were identified but *lo'i* sediments were observed beneath fill layers. Approximately 55 m northeast of T-062. O'Hare et al. (2010) performed an archaeological literature review and field inspection for the Honolulu Community College Advanced Technology Training Center project. T-062 was 30 m north of the archaeological monitoring conducted for a section of Dillingham Boulevard (Medina et al. 2013, in progress).

Documentation Limitations: T-062 was excavated to a depth of 2.05 mbs, and beneath the water table at 1.9 mbs. T-062 was widened by 0.2 m along the southeastern side and 0.1 m on the northwestern side in order to recover for lost excavation area on the southwest end caused by a concrete jacket. Loosely compacted fill created unstable, undermined sidewalls that prevented entry into the excavation and limited documentation.

Stratigraphic Summary: The stratigraphy of T-062 consisted of predominately of fill material sediments overlying natural sediments to the base of excavation. Observed strata included a very gravelly silty loam landscape fill (Ia), crushed coral (Ib), extremely gravelly loam fill (Ic), and a gravelly sandy loam (Id), overlying natural clay loam (SIHP #50-80-14-7426) (II), and the decomposing coral shelf (III). Stratum II was a natural clay loam and likely remnant of agricultural wetland and rice field sediments. The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were observed.

Sample Results: Three bulk sediment samples were collected from the excavation floor within T-062. One sample was collected from Stratum II at 1.45-1.7 mbs (5 L) and two samples were collected for Stratum III at 2.05 mbs (10 L total). The bulk samples were wet-screened. The sample from Stratum II contained 0.1 g of coal slag waste. The sample taken from Stratum III contained 236.35 g of naturally-occurring water-rounded marine shell and one unmodified basalt fragment (3.7 g). The results of sample analysis indicated an association of former wetlands/agricultural sediments.

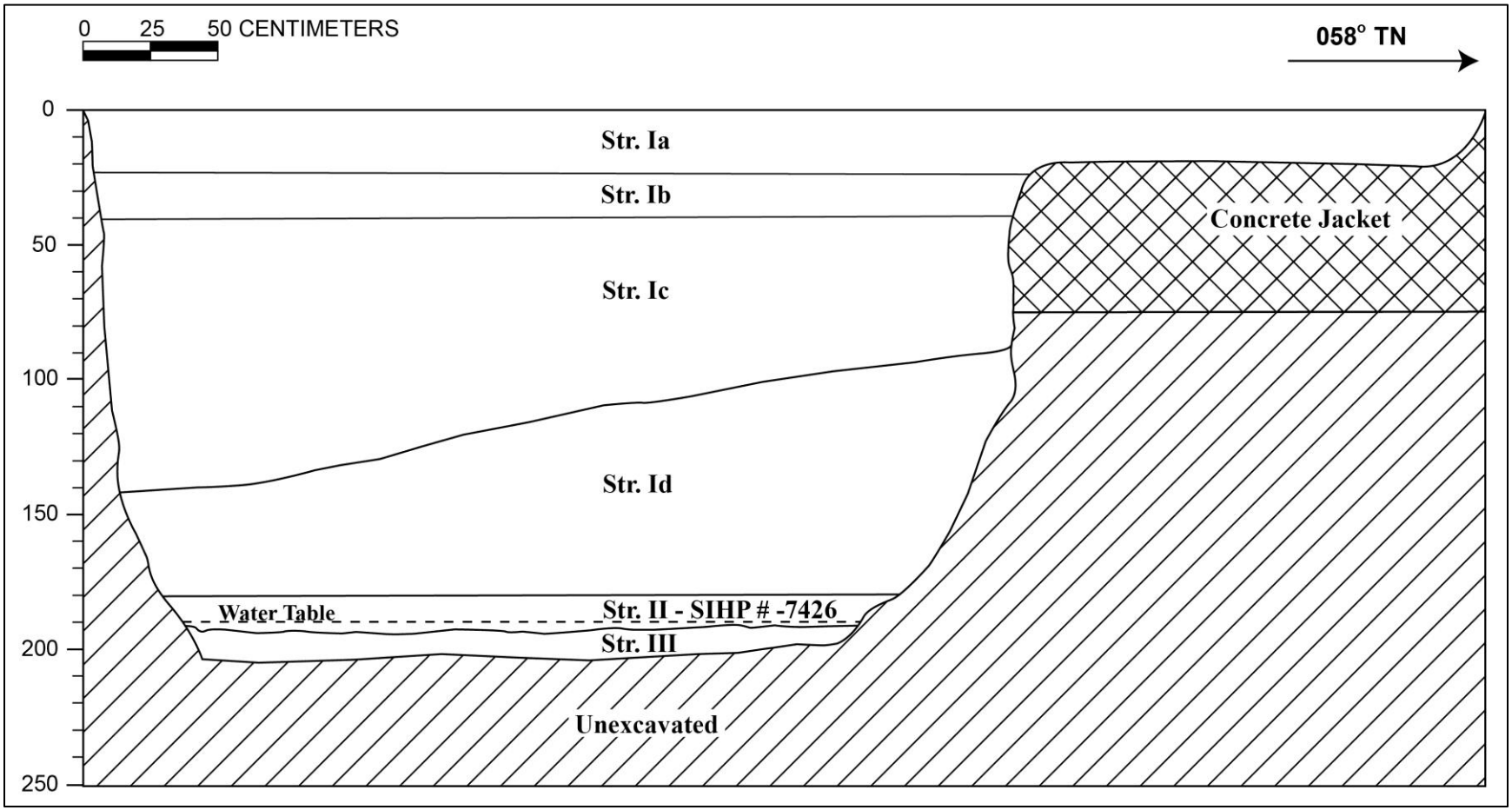
GPR Discussion: A review of amplitude slice maps indicated no linear features although a concrete slab was encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.50 mbs.

GPR depth profiles for T-062 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity which occurred around 0.15 mbs and again around 0.40 mbs. No utilities were observed in the profile although a concrete slab was encountered during excavation. The maximum depth of clean signal return was approximately 1.10 mbs.

Summary: T-062 was excavated to a depth of 2.05 mbs, and beneath the water table at 1.9 mbs. Stratigraphy of T-062 was comprised predominately by fill material sediments (Ia-Id), overlaying natural sediments (II-III). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). The results of sample analysis indicated an association of former wetlands/agricultural sediments. Stratum II is considered a component of SIHP #50-80-14-7426 (see Volume I).

T-062 pre-excavation, view southwest

T-062 northwest wall profile, view southwest



T-062 northwest wall profile

T-062 Stratigraphic summary

Stratum	Depth (cmbs)	Description
Ia	0-25	Fill; 10 YR 4/3 (brown); very gravelly silty loam; weak, fine, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; common, fine roots; contained coral gravel inclusions
Ib	25-40	Fill; 10 YR 7/3 (very pale brown); very gravelly loamy sand; structureless, single-grain; moist, friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few, fine to medium roots; crushed coral fill
Ic	40-143	Fill; 10 YR 5/1 (gray); extremely gravelly loam; structureless, single-grain; moist, friable consistency; non-plastic; terrigenous origin; abrupt, broken/discontinuous lower boundary; few, fine roots;
Id	90-180	Fill; 10 YR 7/4 (very pale brown); gravelly sandy loam; structureless, single-grain; moist, friable consistency; non-plastic; mixed origin; abrupt, broken lower boundary
II	180-195	Natural; 2.5 Y 3/1 (very dark gray); clay loam; moderate, fine, blocky structure; moist, firm consistency; plastic; terrigenous origin; abrupt lower boundary; former wetland/agricultural sediment a component of SIHP# 50-80-14-7426
III	195-205	Natural; 10 YR 5/6 (yellowish brown); coral; structureless, single-grain; moist, indurated consistency; non-plastic; marine origin; lower boundary not visible; decomposing coral shelf

3.16 Test Excavation 63 (T-063)

***Ahupua'a*:**	Kapālama
LCA:	275B:2
TMK #:	1-5-020:003
Elevation Above Sea Level:	1.7 m
UTM:	616911.27 mE, 2358149.55 mN
Max Length/Width/Depth:	6.1 m / 64 cm / 2.28 mbs
Orientation:	304 / 124º TN
Targeted Project Component:	Station Building
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 63 (T-063) was located within the parking lot of the Kapālama strip mall located on the south side of Dillingham Boulevard near the Kokea Street intersection (42m to the northwest) and T-063 was level with the surrounding lot surface. T-063 was near the H&R Block storefront and approximately 80 m southeast of Kapālama Stream. The only utilities indicated were two sewer lines 6 m and 8.8 m east of T-063. This location was privately owned.

Summary of Background Research and Land Use: Brown's 1885 map of Kalihi and Kapālama showed T-063 within the northern portion of LCA 275B:2 awarded to Henry Zupplien. LCA 275 B:2 included 19 or more *lo'i* patches. At this time, T-063 was 132 m southeast of an '*auwai* (irrigation stream) and 7 m southeast of Niuhelewai Stream. Monsarrat's 1897 map of Honolulu indicated T-063 was within an area of a large rice field. By 1919, T-063 was 40 m northwest of Niuhelewai Stream and the surrounding area was dramatically altered with roads and residential developments, according to the 1919 U.S. Army War Department Fire Control map. The 1933 U.S. Army War Department Fire Control map and a 1943 U.S. Army War Department map placed T-063 within a developing street grid system. By 1943, the Niuhelewai Stream was channelized, and the 1953 U.S. Army Mapping Service map showed the Niuhelewai Stream changed to Kapālama Stream and directed into Kapālama Basin. T-063 was shown to be in a building footprint south (*makai)* of Dillingham Boulevard.

Several previous archaeological studies were within the vicinity of T-063. Pammer and Monahan (2011) performed an archaeological literature review and field inspection with limited subsurface testing 110 m northwest of T-063 for the Kapālama Shopping Center re-development project. No historic properties were identified but *lo'i* sediments were observed beneath fill layers. 150 m northeast of T-063 O'Hare et al. (2010) performed an archaeological literature review and field inspection for the Honolulu Community College Advanced Technology Training Center Project. T-063 was 22 m south of the archaeological monitoring conducted for a section of Dillingham Boulevard (Medina et al. 2013, in progress). T-063 was also within an ethnohistoric study area conducted by Uyeoka et al. (2009).

Documentation Limitations: T-063 was excavated to a depth of 2.28 mbs and below the water table at 1.9 mbs.

Stratigraphic Summary: The stratigraphy of T-063 consisted predominately of fill strata overlying natural sediment. Observed strata included asphalt (Ia), extremely gravelly sandy clay loam (Ib), crushed coral fill (Ic), extremely gravelly sand (Id), gravelly silty clay loam (Ie), very gravelly silty sand (If), crushed coral fill (Ig), silty clay (Ih), and crushed coral (Ii), overlying previously disturbed silty clay sediment (IIa), agricultural sediment (IIb), and the decomposing coral shelf (III). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL).

Artifacts Discussion: No artifacts were observed during the investigation of T-063.

Features Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: Faunal remains, collected from Stratum IIb of T-063 (1.72-1.90 mbs) included unidentified fish bone (< 0.1 g.).

Sample Results: A total of two bulk sediment samples were collected from Stratum IIb at 1.72-1.9 mbs (2 L) and from Stratum III at 2.15-2.28 mbs (2 L). Both samples were wet-screened. The sample taken from Stratum IIb contained < 0.1g of fish bone. The sample taken from Stratum III contained non-midden shell (105g). The results of sediment sample analysis indicated no significant cultural material.

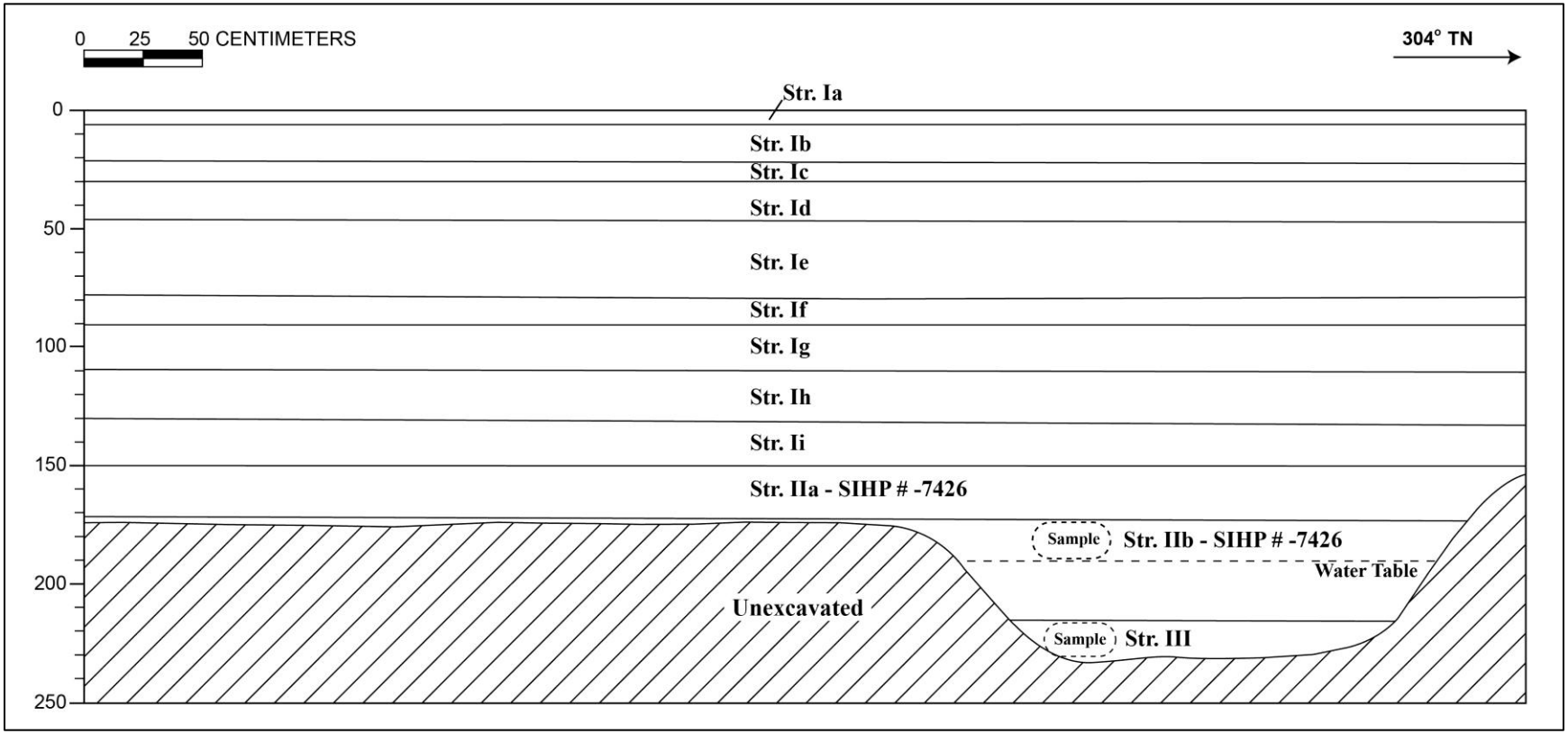
GPR Discussion: A review of amplitude slice maps indicated no linear features which might have indicated the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.25 mbs.

GPR depth profiles for T-063 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity which occurred around 0.35 mbs. No utilities were observed in the profile. The maximum depth of clean signal return was approximately 1.00 mbs.

Summary T-063 was excavated to a depth of 2.28 mbs, and below the water table at 1.9 mbs. Stratigraphy was predominately fill material sediment (Ia-Ii) overlying natural sediments (IIa-III). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). Stratum IIa and IIb are considered to be components of SIHP #50-80-14-7426 (see Volume I).

T-063 pre-excavation, view west

T-063 southwest profile wall



T-063 southwest wall profile

T-063 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-6	Asphalt
Ib	6-22	Fill; 5 YR 3/3 (dark reddish brown); extremely gravelly sandy clay loam; weak, fine, crumb structure; moist, very friable consistency; non-plastic; mixed origin; very abrupt, smooth lower boundary; basalt gravel base course
Ic	22-30	Fill; 10 YR 7/3 (very pale brown); extremely gravelly sand; single-grain structure; moist, loose consistency; non-plastic; marine origin; very abrupt, smooth lower boundary; crushed coral fill deposit
Id	30-46	Fill; 5 YR 3/3 (dark reddish brown); extremely gravelly sand; weak, fine, crumb structure; moist, very friable consistency; non-plastic; mixed origin; very abrupt, smooth lower boundary; fill deposit
Ie	46-79	Fill; 10 YR 4/1 (dark gray); gravelly silty clay loam; weak, very fine, blocky structure; moist, friable consistency; plastic; terrigenous origin; very abrupt, smooth lower boundary
If	79-91	Fill; 2.5 Y 6/1 (gray); very gravelly silty sand; single-grain structure; moist, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; fill deposit
Ig	91-110	Fill; 2.5 Y 6/2 (light brownish gray); extremely gravelly sand; single-grain structure; moist, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; crushed coral fill deposit
Ih	110-131	Fill; 2.5 Y 3/1 (very dark gray); silty clay; moderate, fine, blocky structure; moist, firm consistency; plastic; very abrupt, smooth lower boundary; fill deposit
Ii	131-150	Fill; 2.5 Y 6/2 (light brownish gray); extremely gravelly sand; single-grain structure; moist, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; crushed coral fill deposit
IIa	150-172	Natural; 2.5 Y 3/1 (very dark gray); silty clay; moderate, fine, blocky structure; moist, firm consistency; plastic; terrigenous origin; abrupt, smooth lower boundary; distributed during in-filling; part of former agricultural/wetland sediment; component of SIHP #50-80-14-7426.
IIb	172-215	Natural; GLEY 1 3/N (very dark gray); silty clay; massive structure; wet, very firm, sticky consistency; plastic; terrigenous origin; lower boundary not visible; contains organics visible in sediment; agricultural sediment, organically enriched sediment; a component of SIHP #50-80-14-7426
III	215-228	Natural; GLEY 1 4/5GY (dark greenish gray); very gravelly sandy clay loam; weak, fine, crumb structure; wet, sticky; plastic; mixed origin; lower boundary not visible; natural marine detritus (coral bivalves), sample from bucket below water table

3.17 Test Excavation 64 (T-064)

***Ahupua'a*:**	Kapālama
LCA:	N/A
TMK #:	1-5-017:006
Elevation Above Sea Level:	1.6 m
UTM:	616939.48 mE, 2358198.56 mN
Max Length/Width/Depth:	6 m / 0.6 m / 1.8 mbs
Orientation:	308 / 128º TN
Targeted Project Component:	Station Building
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 62 (T-064) was located within Honolulu Community College on the northern side of Dillingham Boulevard and the Kokea Street intersection. T-064 was 33 m southeast from Kapālama Stream. No utilities indicated near T-064's vicinity.

Summary of Background Research and Land Use: Brown's 1885 map of Kalihi and Kapālama showed T-064 within Konohiki lands, part of Land Commission Grant 10754 to A.L. Castle and Ethelinda S. Castle. At this time T-064 was 95 m southeast of an *'auwai* (irrigation stream) and 13 m north of Niuhelewai Stream. Monsarrat's 1897 map of Honolulu indicated T-064 was within a large rice plantation. By 1919, the surrounding area was dramatically altered with the agricultural lands converted to roads and residential developments, according to the 1919 U.S. Army War Department Fire Control map. The 1933 U.S. Army War Department Fire Control map and a 1943 U.S. Army War Department map placed T-064 within a developing street grid system. Urban development continued through the 1950s and the Niuhelewai Stream was changed to Kapālama Stream and channeled into Kapālama Basin, according to the 1953 U.S. Army Mapping Service map.

Several previous archaeological studies were within the vicinity of T-064. Approximately 92 m northwest of T-064, Pammer and Monahan (2011) performed an archaeological literature review and field inspection with limited subsurface testing for the Kapālama Shopping Center re-development project. No historic properties were identified but *lo'i* sediments were observed beneath fill layers. O'Hare et al. (2010) performed an archaeological literature review and field inspection 77 m northeast of T-064 for the Honolulu Community College Advanced Technology Training Center Project. T-064 was 12 m north of the archaeological monitoring conducted for a section of Dillingham Boulevard (Medina et al. 2013, in progress).

Documentation Limitations: Excavation at T-064 was excavated to a depth of 1.8, and beneath the water table at 1.5 mbs. Trench instability issues prevented entry into the excavation and limited documentation.

Stratigraphic Summary: The stratigraphy of T-064 predominately consisted of fill strata overlying natural sediment to the base of excavation. Observed strata included silty loam landscaping fill (Ia), gravelly silty fine grained sand (Ib), crushed coral fill (Ic), extremely gravelly very fine silty sand (Id), and silty sandy loam consisting of incinerated fill (Ie),

overlying a natural clay layer (IIa), and sandy clay (IIb). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL).

Artifacts Discussion: A total of 21 historic artifacts (see following table and photographs), composed of 2 ceramic vessel fragments, 12 glass fragments (from a minimum of 12 bottles), and 7 miscellaneous artifacts, were collected from T-064, Stratum Ie, 0.65-1.35 mbs. Stratum Ie was an historic, incinerated refuse layer. One American-made ceramic (Acc. #064-A-1) was manufactured from 1909-1914, the majority of the glass bottles are American-made and date to the 1930s-1940s, and two ceramic insulators post-date 1915.

Features Discussion: No features were observed

Terrestrial Faunal Remains Collected During Excavation: Terrestrial faunal remains (possible Aves and *Bos taurus*) were collected from Stratum Ie at 0.63-1.35 mbs. Five fragments collected included one femur with unfused edges (possible Aves), a humerus diaphysis section, one long bone shaft (rust and breakaway spurs present), two diaphysis sections and a vertebra portion all of which belong to species *Bos taurus*. Faunal remains which were collected from Stratum Ie were considered to be part of the imported fill deposits.

Sample Results A total of two bulk sediment samples were collected from Stratum IIa at 1.30-1.53 mbs (2 L) and from Stratum IIb at 1.53-1.80 mbs (2 L). Both sediment samples were wet-screened. The sample taken from Stratum IIa contained 0.1 g of *Ruppia maritima* seeds and one clear glass shard fragment. The sample taken from Stratum IIb contained naturally-occurring, water-rounded marine shell (75 g). The results of sample analysis indicated that Stratum IIa was associated with former wetlands/agricultural sediments.

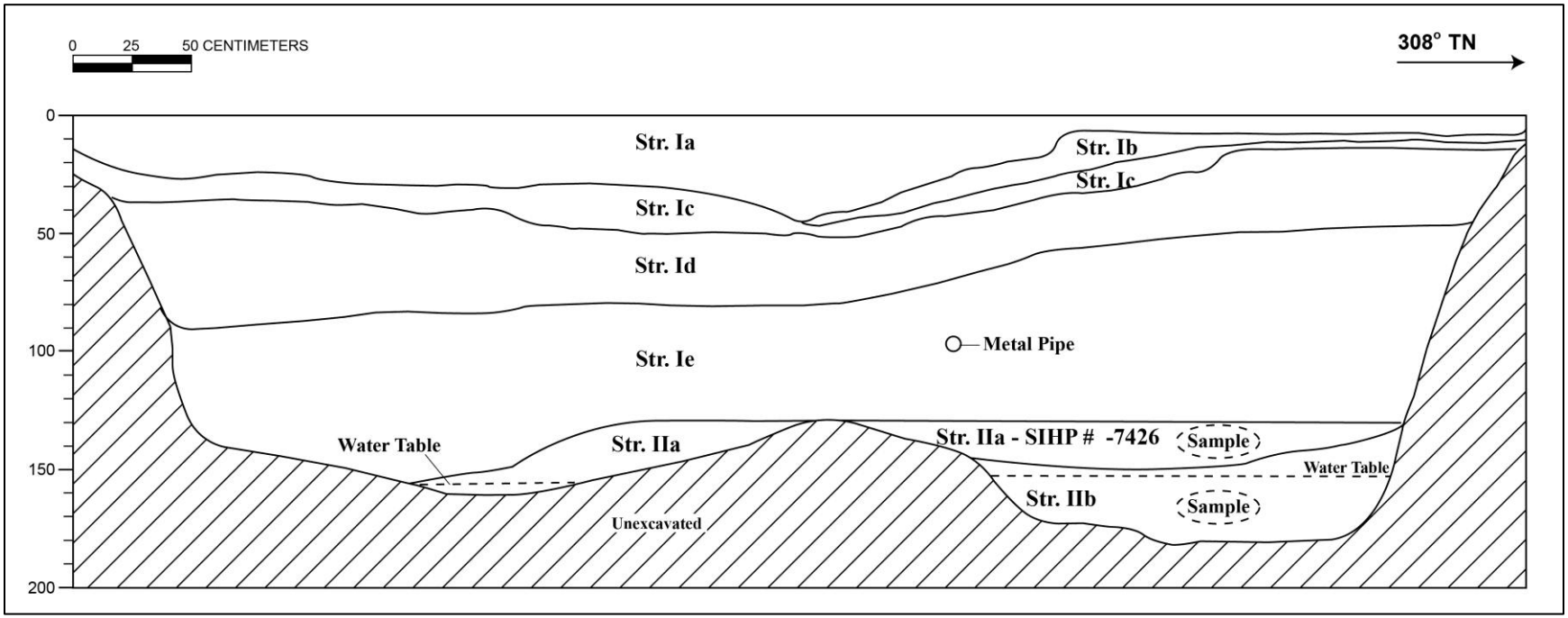
GPR Discussion: A review of amplitude slice maps indicated no linear features which might have indicated the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.25 mbs.

GPR depth profiles for T-064 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity which occurred around 0.20 mbs. No utilities were observed in the profile. The maximum depth of clean signal return was approximately 0.75 mbs.

Summary: Excavation at T-064 was excavated to a depth of 1.8, and beneath the water table at 1.5 mbs. The stratigraphy of T-064 predominately consisted of fill strata (Ia-Ie) overlying natural sediment (IIa-IIb) to the base of excavation. The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). Faunal remains collected from Stratum Ie were considered to be part of the imported fill deposits. The results of sample analysis indicated that Stratum IIa was associated with former wetlands/agricultural sediments. Stratum IIa is considered a component of SIHP #50-80-14-7426 (see Volume I).

T-064 pre-excavation, view to northwest

T-064 southwest profile wall, view southeast.



T-064 southwest wall profile.

T-064 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-46	Fill; 5 YR 3/4 (dark reddish brown); silty loam; fine, crumb structure; moist, very friable consistency; non-plastic; terrigenous origin; abrupt, irregular lower boundary; many, very fine to medium roots; landscaping fill
Ib	9-48	Fill; 10 YR 6/1 (light gray); gravelly fine silty sand; structureless; moist, loose consistency; non-plastic; mixed origin; abrupt, broken/discontinuous lower boundary; fill deposit
Ic	12-51	Fill; 7.5 YR 7/8 (reddish yellow); very fine sand; structureless, moist, loose consistency; non-plastic; marine origin; abrupt; smooth lower boundary; fill deposit
Id	15-90	Fill; 10 YR 5/4 (yellowish brown); extremely gravelly very fine silty sand; structureless; moist, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; contains concrete chunks and rebar
Ie	46-160	Fill; 5 YR 3/2 (dark reddish brown); silty sandy loam; moist, friable consistency; non-plastic; mixed origin; clear lower boundary; contained clear glass fragments, glass bottles, melted metal pieces, earthen ware etc., faunal bone; incinerated fill layer
IIa	130-160	Natural; 2.5 Y 3/1 (very dark gray); clay; massive, structureless; wet, slightly sticky consistency; very plastic; terrigenous origin; diffuse lower boundary; many, very fine oots; natural clay layer associated with wetland/agricultural sediment, 2 L bulk sample collected, considered a component of SIHP # 50-80-14-7426
IIb	130-180	Natural; GLEY 1 3/N (very dark gray); sandy clay; massive, structureless; wet, sticky consistency; slightly plastic; marine origin; lower boundary not visible

T-064 Historic Artifact Analysis

Acc. # 064-A-	Prov.	Ceramic Vessel Type	Portion	No.	Paste; Decoration	Origin; Age	Comments
1	T-064, St. Ie	Unknown	Complete	1	Earthenware, Refined		Molded piece shaped like a horn with a hole
2	T-064, St. Ie	Hollowware, bowl	Base to rim	1	Porcelain; Painted underglazed	American; 1909-1914	“Buffalo China,” Mark used from 1909-1914
Acc. # 064-A-	**Prov.**	**Glass Bottle Type**	**Portion**	**No.**	**Color**	**Origin; Age**	**Comments**
3	T-064, St. Ie	Bottle, soda	Base to body	1	Green, Light	American - 1945	Seven-up bottle; Owens-Illinois Glass Co. base mark; Bottler, Sunrise Soda Works, Kalihi-Pālama, O’ahu
4	T-064, St. Ie	Bottle, cosmetic	Body	1	White		Milk glass
5	T-064, St. Ie	Bottle, beer	Complete	1	Amber	American, 1945	Anchor-Hocking Glass Co. base mark
6	T-064, St. Ie	Bottle, beer	Complete	1	Amber	American, 1946	Owens-Illinois Glass Co. base mark
7	T-064, St. Ie	Bottle, beer	Base	1	Amber	American, 1945	Anchor-Hocking Glass Co. base mark
8	T-064, St. Ie	Bottle, beverage	Base	1	Clear	American, 1944	Hazel-Atlas Glass Co. base mark
9	T-064, St. Ie	Bottle, medicine	Complete	1	Brown	American, 1945	H. Clay Glover Co., New York patent medicine; Owens-Illinois Glass Co. base mark
10	T-064, St. Ie	Bottle, medicine	Complete	1	Clear	American, 1941	Owens-Illinois Glass Co. base mark
11	T-064, St. Ie	Bottle, medicine	Complete	1	Clear	1870s-post	Date based on color
12	T-064, St. Ie	Bottle, condiment	Complete	1	Clear	1907-post	ABM bottles
13	T-064, St. Ie	Jar, cosmetic	Complete	1	Clear	American, 1903-post	“Seventeen on base; ABM jar
14	T-064, St. Ie	Bottle, beverage	Complete	1	Clear	American, 1945	Owens-Illinois Glass Co. base mark and date code

Acc. # 064-A-	Prov.	Misc. Type	Portion	No.	Material	Origin; Age	Comments
15	T-064, St. Ic	Ammunition cartridge	Complete	1	Metal		Rim fire?; very corroded
16	T-064, St. Ic	Cosmetic compact	Complete	1	Metal	1930-1940s	Cosmetic compact case; similar to Helena Rubenstein compact in T-031
17	T-064, St. Ic	Insulator, electrical	Fragment	1	Ceramic (porcelain)		
18	T-064, St. Ic	Machine part, rod	Fragment	1	Metal		glass fused onto rod
19	T-064, St. Ic	Spoon, serving	Complete	1	Metal		No decoration
20	T-064, St. Ie	Insulator	Fragment	1	Ceramic (porcelain)	American, 1915-post	Made by Pyrex, G.E. U.S.A.
21	T-064, St. Ie	Insulator	Fragment	1	Composite		Porcelain and metal
22	T-064, St. Ie	Insulator cleat	Fragment	1	Ceramic (Porcelain)	American - 1919-post	Made by Universal Clay Products Co., Sandusky, OH

T-064 porcelain cup (Acc. #064-A-1) and earthenware item (Acc. #064-A-2), from Stratum Ie

T-064 glass bottles and glass bottle fragments (Acc. # 064-A-3 to A-13, shown from left to right and top to bottom) from Stratum Ie

T-064 glass beverage bottle (Acc. # 064-A-14) from Stratum Ie

T-064 glass beverage bottle base (Acc. # 064-A-14) from Stratum Ie

3.18 Test Excavation 65 (T-065)

***Ahupua'a*:**	Kapālama
LCA:	N/A
TMK#:	1-5-017:006
Elevation Above Sea Level:	1.8 m
UTM:	616959.04 mE, 2358224.3 mN
Max Length/Width/Depth:	6.2 m / 0.6 m / 1.9 mbs
Orientation:	52 / 232º TN
Targeted Project Component:	Station Building
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 65 (T-065) was within Honolulu Community College located on the north side of Dillingham Boulevard and the Kokea Street intersection. T-065 was 22 m southeast from Kapālama Stream. No utilities were indicated near T-065.

Summary of Background Research and Land Use: Brown's 1885 map of Kalihi and Kapālama showed T-065 within Konohiki lands part of Grant 10754 to A.L. Castle and Ethelinda S. Castle. At this time T-065 was 97 m southeast of an *'auwai* (irrigation stream) and 14 m north of Niuhelewai Stream. Monsarrat's 1897 map of Honolulu indicated T-065 was within a large rice plantation. By 1919 the surrounding area was dramatically altered with the agricultural lands converted to roads and residential developments, according to the 1919 U.S. Army War Department Fire Control map. The 1933 U.S. Army War Department Fire Control map and a 1943 U.S. Army War Department map placed T-065 within a developing street grid system with urban development continued through the 1950s. The Niuhelewai Stream was changed to Kapālama Stream and channeled into Kapālama Basin by 1953, according to the 1953 U.S. Army Mapping Service map.

Several previous archaeological studies were within the vicinity of T-065. Approximately 86 m northwest of T-065 Pammer and Monahan (2011) performed an archaeological literature review and field inspection with limited subsurface testing for the Kapālama Shopping Center re-development project. No historic properties were identified but *lo'i* sediments were observed beneath fill deposits. O'Hare et al. (2010) performed an archaeological literature review and field inspection 41 m northeast of T-065 for the Honolulu Community College Advanced Technology Training Center Project. T-065 was 45 m northeast of the archaeological monitoring conducted for a section of Dillingham Boulevard (Medina et al. 2013 [in progress]).

Documentation Limitations: T-065 was excavated to a depth of 1.9 mbs, and beneath the water table at a depth of 1.8 mbs. An electric utility prevented excavation to the water table in the northeast end of T-065.

Stratigraphic Summary: The stratigraphy of T-065 predominately consisted of fill strata overlying natural sediment to the base of excavation. Observed strata included silty loam landscape fill (Ia), very sandy silt (Ib), imported cinder fill (Ic), and gravelly silty loam (Id),

overlaying natural clay (II), and the decomposing coral shelf (III). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL).

Artifacts Discussion: One artifact was collected from Stratum Id between 0.37-1.56 mbs. The artifact included one glass Coca-Cola bottle base (Acc. # 065-A-1, see following photograph). The results of artifact analysis indicated that the Coca-Cola bottle base was manufactured after 1915.

Features Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: Terrestrial faunal remains (*Aves* sp.) were collected from Stratum Id at 0.37-1.56 mbs. Remains included left and right humeri, pelvis fragments, and left and right ulna. Faunal remains were considered to be part of the imported fill deposits.

Sample Results A total of one bulk sediment sample was collected from Stratum II at 1.67-1.7 mbs (3.0 L) and contained (0.1g) of charcoal and coal. One column sample was collected from Stratum Id between 1.7 and 1.8 mbs and was not sent for further analysis. The results of sample analysis indicated that no significant cultural material was present.

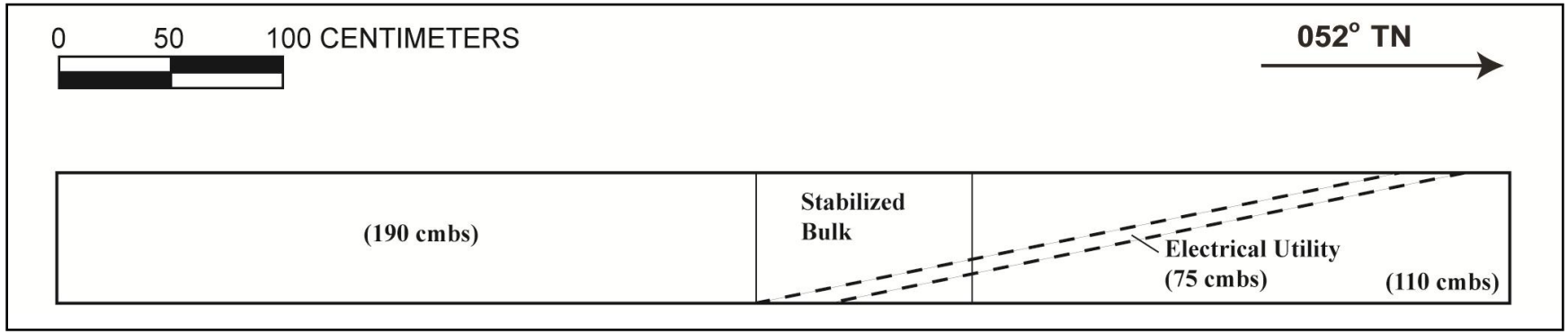
GPR Discussion: A review of amplitude slice maps indicated no linear features although an electrical utility was encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.50 mbs.

GPR depth profiles for T-065 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity which occurred around 0.15 mbs. No utilities were observed in the profile although an electrical utility was encountered during excavation. The maximum depth of clean signal return was approximately 0.80 mbs.

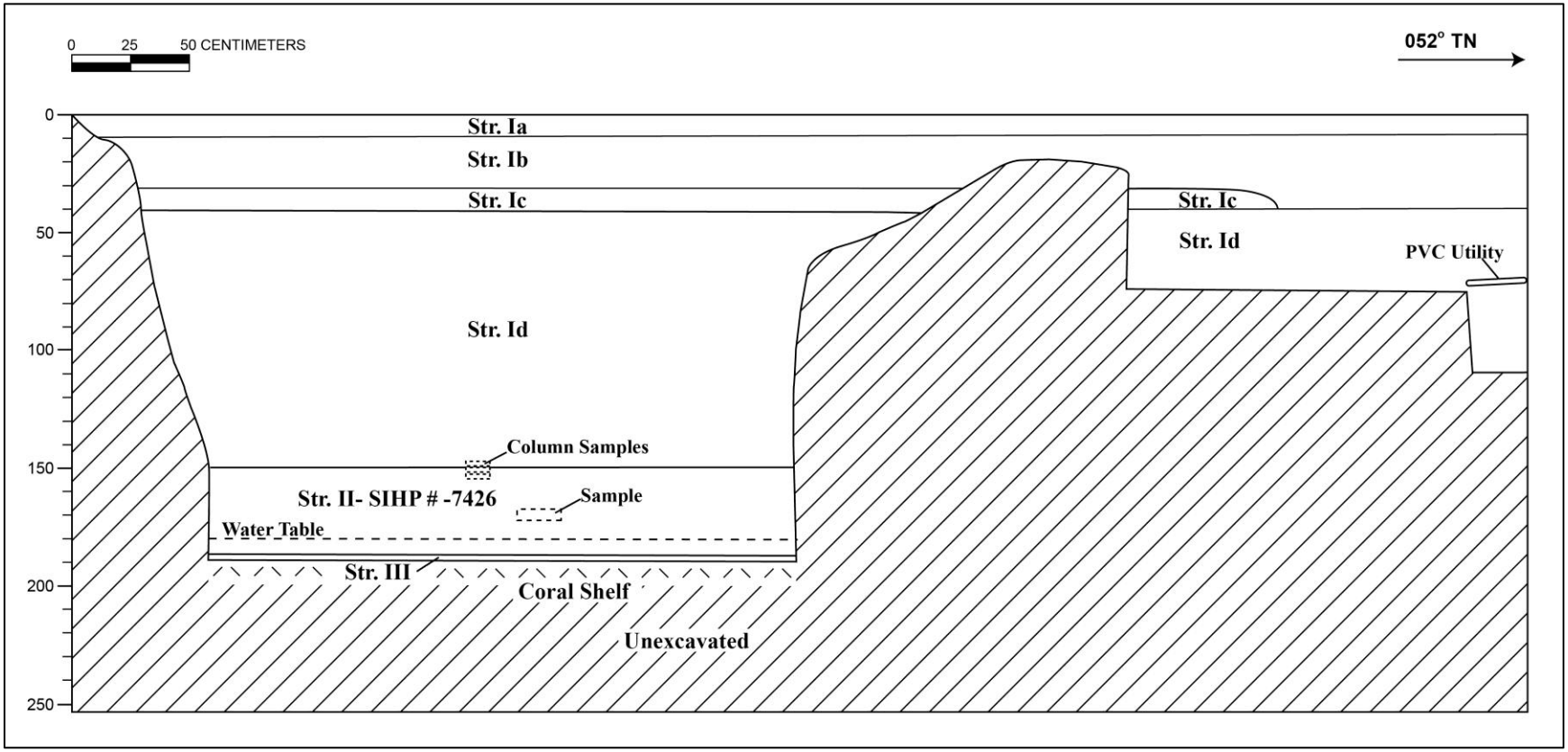
Summary: T-065 was excavated to below water table at a depth of 1.9 mbs. Stratigraphy consisted of fill material (Ia-Id) overtop of natural sediments (II-III). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). The results of artifact analysis indicated that the Coca-Cola bottle base was manufactured after 1915. Faunal remains were considered to be part of the imported fill deposits. Stratum II is considered a component of SIHP # 50-80-14-7426 (see Volume I).

T-065 general location, view to northwest

T-065 northwest wall profile , view to north



T-065 post-excavation plan view showing a utility line, the stabilized bulk and the upper boundary of Stratum III



T-065 northwest wall profile

T-065 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-12	Fill; 10 YR 2/2 (very dark brown); silt loam; weak, fine, granular structure; moist, loose consistency; slightly plastic; terrigenous origin; clear, smooth lower boundary; common, very fine and fine roots; modern A-horizon, surface layer some organic material
Ib	12-36	Fill; 10 YR 3/4 (dark yellow brown); very sandy silt; structureless, single-grain; moist, very firm consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; common, very fine, fine and medium roots; imported fill
Ic	32-41	Fill; 10 YR 4/2 (dark grayish brown); sand; structureless, single-grain; moist, loose consistency; non-plastic; terrigenous origin, smooth lower boundary; imported fill, cinder
Id	37-156	Fill; 10 YR 3/6 (dark yellowish brown); slightly gravelly silt loam; structureless, single-grain; moist, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few, fine to medium roots; contained glass bottle base, faunal bone, PVC utility, other ferrous (metal) pieces; imported fill, small amount of sub-angular basalt gravel
II	150-188	Natural; 10 YR 3/1 (dark gray); silty clay loam; crumb structure; wet, sticky consistency; plastic; terrigenous origin; clear, smooth lower boundary; natural sediment, alluvial deposit, a component of SIHP # 50-80-14-7426
III	188-190	Natural; 10 YR 5/1 (gray); extremely gravelly silt; structureless, single-grain; wet, loose; non-plastic; marine origin; lower boundary not visible; decomposing coral shelf

T-065 “Coca-Cola” glass bottle fragment (Acc. # 065-A-1) from Stratum Id

3.19 Test Excavation 66 (T-066)

***Ahupua'a*:**	Kapālama
LCA:	N/A
TMK#:	1-5-017: 006
Elevation:	1.6 m
UTM:	616945.27 mE, 2358203.55 mN
Max Length/Width/Depth:	6.0 m / 0.78 m / 1.64 mbs
Orientation:	122 / 302º TN
Targeted Project Component:	Station Building
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 66 (T-066) was within Honolulu Community College located on the north side of Dillingham Boulevard and the Kokea Street intersection. T-066 was 31 m southeast from Kapālama Stream. No utilities were indicated near T-066.

Summary of Background Research and Land Use: Brown's 1885 map of Kalihi and Kapālama showed T-066 within Konohiki lands part of Grant 10754 to A.L. Castle and Ethelinda S. Castle. At this time T-066 was 97 m southeast of an *'auwai* (irrigation stream) and 14 m north of Niuhelewai Stream. Monsarrat's 1897 map of Honolulu indicated T-066 was within a large rice plantation. By 1919 the surrounding area was dramatically altered with the agricultural lands converted to roads and residential developments, according to the 1919 U.S. Army War Department Fire Control map. The 1933 U.S. Army War Department Fire Control map and a 1943 U.S. Army War Department map placed T-066 within a developing street grid system. Urban development continued through the 1950s and the Niuhelewai Stream was changed to Kapālama Stream and channeled into Kapālama Basin, according to the 1953 U.S. Army Mapping Service map. As the formal Kalihi and Kapālama areas continued to develop T-066 was north of Dillingham Boulevard.

Several previous archaeological studies were within the vicinity of T-066. Approximately 90 m northwest of T-066 Pammer and Monahan (2011) performed an archaeological literature review and field inspection with limited subsurface testing for the Kapālama Shopping Center Redevelopment Project. No historic properties were identified but *lo'i* sediments were observed beneath fill layers. O'Hare et al. (2010) performed an archaeological literature review and field inspection 67 m northeast of T-066 for the Honolulu Community College Advanced Technology Training Center Project. T-066 was 19 m north of archaeological monitoring conducted for a section of Dillingham Boulevard (Medina et al. 2013 [in progress]).

Documentation Limitations: Excavation at T-066 was excavated to a depth of 1.68 mbs, and beneath the water table at 1.54 mbs. Loosely compacted fill created unstable, undermined sidewalls that prevented entry into the excavation and limited documentation.

Stratigraphic Summary: The stratigraphy of T-066 consisted of fill strata overlying natural sediment to the base of excavation. Observed strata included gravelly sandy loam landscape fill (Ia), very gravelly clay loam (Ib), and a very gravelly silty loam composed of a trash layer (Ic),

overlying natural clay (II). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL).

Artifacts Discussion: A total of thirty five (35) historic artifacts, 12 ceramic fragments (minimum of 9 vessels) and 23 glass fragments (minimum of 8 bottles) were collected from 0.48-1.48 mbs in Stratum Ic (silty loam fill). Stratum Ic was a burned trash layer composed of historic artifacts. The ceramics (Acc. # 066-A-1 to A-9, see following table and photograph) were a mixture of Asian and Anglo-American wares. The bottles (Acc. # 066-A-10 to A-30, see following table and photograph) with some manufacturing attributes were all made in the machine-blown era (post 1907), and some bottles could be definitely dated to the 1930s-1950s period. Artifacts collected from Stratum Ic were consistent with early to mid-twentieth century domestic refuse deposits.

Features Discussion: No features were observed

Terrestrial Faunal Remains Collected During Excavation: Terrestrial faunal remains (species; Bos *taurus* and Sus *scrofa*) were collected from Stratum Ic at 0.48-1.48 mbs. Bos *taurus* remains had evidence of being butchered and cut with a metal blade. Faunal remains were considered to be food remnants.

Sample Results: No bulk sediment samples were collected. See above for discussion of collected artifacts.

GPR Discussion: A review of amplitude slice maps indicated no linear features which might have indicated the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.25 mbs.

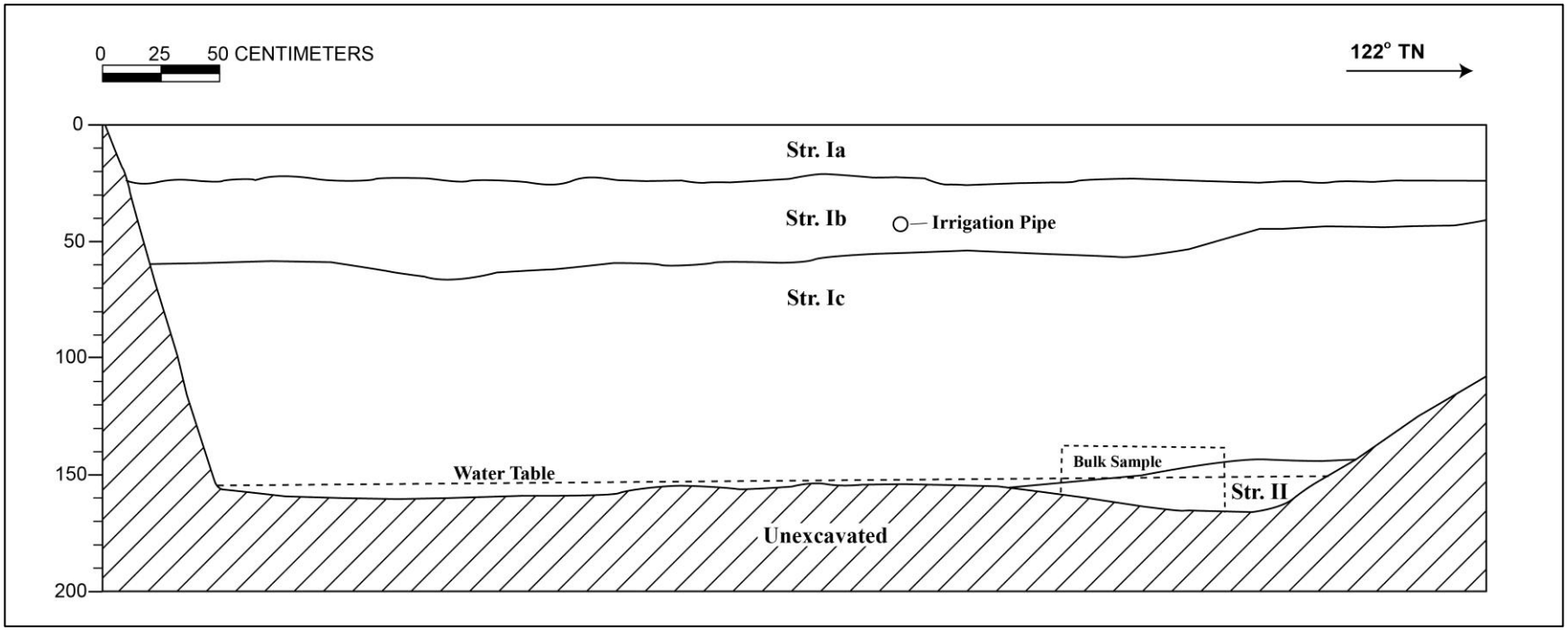
GPR depth profiles for T-066 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity which occurred around 0.25 mbs. No utilities were observed in the profile although an irrigation pipe was encountered during excavation. The maximum depth of clean signal return was approximately 0.90 mbs.

Summary: Excavation at T-066 was excavated to a depth of 1.68 mbs, and beneath the water table at 1.54 mbs. The stratigraphy of T-066 consisted of fill strata (Ia-Ic) overlying natural sediment (II) to the base of excavation. The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). Artifacts collected from Stratum Ic were consistent with early to mid-twentieth century domestic refuse deposits. Faunal remains were considered to be food remnants. Stratum II is considered to be a component of SIHP# 250-80-14-7426 (see Volume I).

.

T-066 general location, view to the north)

T-066 northeast wall profile



T-066 northeast wall profile

T-066 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-27	Fill; 10 YR 4/2 (dark grayish brown); gravelly sandy loam; structureless, single-grain; dry, loose consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; many, fine roots; Modern A-horizon, landscape fill
Ib	25-66	Fill; 10 YR 5/3 (brown); very gravelly clay loam; structureless, massive, moist, firm consistency; slightly plastic; mixed origin; diffuse, smooth lower boundary; common, fine roots; contained coral cobbles
Ic	45-155	Fill; 10 YR 5/3 (brown); very gravelly silty loam; moist, friable consistency; clear, smooth lower boundary; contained faunal, bottle, glass, ceramic, metal; historic, burned trash layer
II	146-168	Natural; 10 YR 3/1 (very dark gray); clay; weak, fine, blocky structure; wet, slightly sticky consistency; plastic; terrigenous origin; lower boundary not visible; peaty substance present

T-066 Historic Artifact Analysis

Acc. # 066-A-	Prov.	Ceramic Vessel Type	Portion	No.	Paste; Decoration	Origin; Age	Comments
1	T-066, St. Ic	Chamber pot or wash basin	Body (2); base (1)	3	Stoneware	Anglo/ American	White; "TH" in circle stamped on base
2	T-066, St. Ic	Flatware	Rim	1	Porcelain	Anglo/ American	White with two green bands
3	T-066, St. Ic	Hollowware - bowl	Body to rim	1	Earthenware, Refined	Anglo/ American	Tan glaze; brown band near rim; stamped underside of base has green letters "DESE… / W..."
4	T-066, St. Ic	Flatware	Body	1	Porcelain		
5	T-066, St. Ic	Hollowware - bowl	Base	1	Porcelain	Asian	White; High foot
6	T-066, St. Ic	Dinnerware	Rim	1	Earthenware, Refined	Anglo/ American	Yellow glaze with molded band
7	T-066, St. Ic	Hollowware	Body	2	Porcelain; Painted	Asian	Bluish-white; Asian design- blue flowers
8	T-066, St. Ic	Dinnerware	Rim	1	Porcelain; Painted		Blue band on rim interior
9	T-066, St. Ic	Flatware	Rim	1	Porcelain; Painted		Floral; polychrome floral motif
Acc. # 066-A-	**Prov.**	**Glass Bottle Type**	**Portion**	**No.**	**Color**	**Origin; Age**	**Comments**
10	T-066, St. Ic	Bottle, Medicine	Complete	1	Blue, Cobalt	American; post 1920	Vicks Vapo-rub
11	T-066, St. Ic	Bottle	Complete	1	Green, Light	American; 1907-post	"DE S PAT" "9248" embossed
12	T-066, St. Ic	Jar, Cosmetic	Complete	1	White	American; 1900-1950s	Milk glass; "WOODBURY"
13	T-066, St. Ic	Bottle	Body	2	Amber		
14	T-066, St. Ic	Bottle	Body	1	Aqua	1860s-post	Fragments embossed 6
15	T-066, St. Ic	Bottle	Body	1	Blue, Cobalt		
16	T-066, St. Ic	Bottle, Beverage	Base	1	Clear	1932-post	Glenshaw Glass Co. base mark
17	T-066, St. Ic	Bottle, Beverage	Body	1	Clear	American; 1933-1955	Delaware Punch; bottled by Nesbitt Bottling Co., O'ahu
18	T-066, St. Ic	Bottle	Body	2	Clear	1870s-post	Fused (heat-altered) fragments
19	T-066, St. Ic	Bottle	Body	1	Clear	1870s-post	
20	T-066, St. Ic	Vial, Medicine	Body	1	Clear	1870s-post	

Acc. # 066-A-	Prov.	Glass Bottle Type	Portion	No.	Color	Origin; Age	Comments
21	T-066, St. Ic	Bottle, Beverage	Lip	1	Clear	1907-post	
22	T-066, St. Ic	Bottle, Beverage	Neck-lip	1	Clear	1907-post	Letters on fragment “NOT”
23	T-066, St. Ic	Bottle	Neck-lip	1	Clear	1907-post	Narrow-mouth
24	T-066, St. Ic	Bottle	Neck-lip	1	Clear	1907-post	Narrow-mouth
25	T-066, St. Ic	Bottle, Beverage	Neck-lip	1	Clear	1907-post	
26	T-066, St. Ic	Bottle	Complete	1	Clear	1903-post	Diamond shape, wide mouth; embossed on base "28 1405"
27	T-066, St. Ic	Bottle, Beverage	Complete	1	Clear	American; 1930s-1940	Owens Illinois Glass co. base mark for 1930s or 1940s “
28	T-066, St. Ic	Bottle	Base-body	1	Green, Light	American; 1948	Owens Illinois Glass co. base mark
29	T-066, St. Ic	Bottle, Coke	Body	1	Green, Light	American; 1915-post	Hobble skirt Coca Cola
30	T-066, St. Ic	Bottle, Beverage	Neck-lip	1	Green, Light	1907-post	

T-066 ceramic fragments (Acc. # 066-A-1 to A-9, from left to right and top to bottom) from Stratum Ic

T-066 glass bottles and bottle fragments (Acc. # 066-A-10 to A-30) from Stratum Ic